FEATURE
Deep-hole drilling
Fruit Flies & Zebrafish
Björk

FEATURE
Academics & Industry:
Research sabbaticals

SPOTLIGHT
Health & Well-being
Discover opens the door to a hidden world of innovation and invention, where researchers at the University of Sheffield and their partners in the private, public and third sectors are collaborating to find real world solutions to real world problems. From the local to the global, these partnerships are where the energy, enterprise and drive of the wider community is harnessed to the cutting edge talents of the University’s academic teams: discovering solutions together.

Catalytic Clothing seeks to explore how clothing and textiles can be used as a catalytic surface to purify air, employing existing technology in a new way. It is the brainchild of artist/designer Helen Storey and chemist Professor Tony Ryan – people from very different worlds whose minds have come together over recent years in highly successful art/science collaborations.

Find out more at catalytic-clothing.org and in the next issue.
Welcome to the first edition of Discover, a magazine that celebrates how the University of Sheffield collaborates and engages with the private, public and voluntary sectors to enhance the lives of people in our own neighbourhoods and across the world. The University is determined not only to pursue cutting edge research, but to do so in a way that translates this knowledge and expertise into real world solutions to real world problems.

This spirit of collaboration applies not only to our work with partners outside the University, but also to the work we do within the University. Long gone are the days when physicists only talked to physicists, or sociologists only talked to sociologists. The University of Sheffield breaks down barriers between people and disciplines, with the result that we have scientists, engineers, social scientists, clinicians, and arts and humanities specialists, engaged in collaborative projects, pooling their talents and expertise to find novel solutions to complex and seemingly intractable real-world problems. This is a source of huge strength within the University.

We get huge strength and richness from the new insights that come from these relationships. We know the University can sometimes seem like a big and complex organisation that is rather daunting to access. This is why we have streamlined our internal structures, creating simplified gateways staffed with business-friendly professionals who talk your language and who can guide you quickly to the right person or faculty.

Discover shows how the University of Sheffield continues to be a constructive and powerful community of scholarship, providing real benefits for individuals and society, by building relationships with like-minded partners, just as our founders intended.

‘The right institute, at the right time, in the right place’.
The Rt Hon leader Ed Miliband officially launched the Sheffield Political Economy Research Institute (SPERI) in early 2012. SPERI is a new interdisciplinary research institute which aims to bring together leading international researchers in the social sciences, policy-makers, journalists and opinion formers to reassess and develop substantive proposals to respond to the political and economic challenges posed by the global financial crisis and its legacy.

http://speri.dept.shef.ac.uk
BUBBLES FLOAT
biofuel growth

A cost-effective solution to harvesting algae for use as a biofuel has been developed using microbubble technology pioneered at the University of Sheffield.

Biofuels, made from plant material, are considered an important alternative to fossil fuels and algae, in particular, has the potential to be a very efficient biofuel producer.

Until now, however, there has been no cost-effective method of harvesting and removing the water from the algae for it to be processed effectively.

Now, a team led by Professor Will Zimmerman in the Department of Chemical and Biological Engineering believe they have solved the problem.

The system developed by Professor Zimmerman’s team uses 1000 times less energy to produce the microbubbles and the cost of installing the Sheffield microbubble system is predicted to be much less than existing flotation systems.

The next step is to develop a pilot plant to test the system at an industrial scale. Professor Zimmerman is already working with Tata Steel in Scunthorpe using CO2 for it to be processed effectively.

The global reputation of the Management School at the University of Sheffield has been further acknowledged by the leading international system of quality assessment.

Professor Keith Glaister, Dean of the Management School, said: ‘This is a significant achievement for the school and recognition of the hard work and dedication of my colleagues to meet the international benchmark of excellence that the award represents.’

Ian Proctor, Head of Business Development and External Relations, added: ‘This award indicates the growing reputation of the school and our place in the business community. Our priority now must be to see how we can better serve, and anticipate, the needs of the business community regionally, nationally and internationally.’

Accreditation is seen as one of the key factors that applicants look for when selecting both undergraduate and postgraduate education and it is hoped it will help the school to continue to attract talented students from across the world in the future.

SUPPLY CHAIN
waste cut

Waste hotspots in supply chains can be identified by a new management tool designed by researchers at the University of Sheffield to help companies cut their carbon emissions.

‘The Supply Chain Environmental Analysis Tool (SCEnAT) allows firms to promote their green credentials to supply chain partners and customers,’ said Professor Lenny Koh, of the University’s Management School.

Ian Shellard, Global Physical Logistics Director of Rolls-Royce plc said: ‘This can be used in a very creative way in assessing the texture, the taste or even the smell of a product.’

BENCHMARK OF EXCELLENCE
for school

The global reputation of the Management School at the University of Sheffield has been further acknowledged by the leading international system of quality assessment.

After a rigorous three-year application process, the school joins just 23 institutions in the UK and only 133 internationally to be accredited by the European Quality Improvement System (EQUIS).

The accreditation reflects the high quality of the school’s activities, focusing on excellent academic standards, as well as effective internationalisation and collaboration with the worlds of business and industry.

KEEP (SOME OF) your hair on

A hairy chest may be a turn-on for some women, but it’s a big turn-off for bed bugs, according to research at the University of Sheffield.

‘Our findings show that more body hairs mean better detection of parasites,’ said Professor Siva-Jothy, who runs a research group studying the biology of blood-sucking insects and their reproduction and immunity. ‘The aim is to find ways of controlling the insects and preventing the transmission of insect-borne disease.

‘The hairs have nerves attached to them and provide us with the ability to detect displacement,’ he said. ‘By forming a barrier and providing detection these hairs prolong search time and make detection more likely because the bug has to spend more time clambering over them. Our proposal is that we retain the fine covering because it aids detection and if we lost all hair, even the relatively invisible fine hair, our detection ability goes right down.’

NO MORE lumpy ketchup

A device that can predict how liquids flow under different conditions will ensure consumer products – from make-up to ketchup – are of the right consistency.

The technology developed at the University of Sheffield monitors how the viscous components of liquids change during a production process, making it easier, quicker and cheaper to control.

Dr Julia Rees from the University’s School of Mathematics and Statistics said: ‘Companies that make liquid products need to know how the liquids will behave in different circumstances because these different behaviours can affect the texture, the taste or even the smell of a product.’

Top Five UK SUN SpOTS
01 Portsmouth
02 Cardiff
03 Ramsgate
04 Camborne
05 Swansea

Source: The University of Sheffield Media Centre
sheffield.ac.uk/mediacentre

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When Nikki Dibben sent a copy of her book about Björk to the Icelandic singer’s manager, she had no idea that it would lead to an invitation to work on the pop star’s next album – the groundbreaking and hugely successful Biophilia.

'I had based the book on interviews with many of those who work with Björk, but I couldn’t get an interview with the singer herself,' said Nikki, a Senior Lecturer in the University’s Department of Music.

In part, the book explored how Björk, a noted environmental campaigner, reconciled technology and nature through her music. 'She liked what I had written and wanted me involved in her next project because it would have an educational dimension,' Nikki added.

But what began as 'a little bit of writing' for the project website rapidly evolved into something much more significant. 'The new album is the first to be released as an app – and I was a part of the team involved at every stage of its creation. I got an insider’s view of the creative, collaborative process and how the team enabled Björk to realise her artistic vision.'

Biophilia is a multimedia collection that encompasses music, apps, Internet, installations and live shows; and behind it all are Nikki’s extensive ‘programme notes’ explaining to the listener why the music sounds as it does.

It was her involvement at every stage of the creative process, along with her intimate interviews with Björk, that enabled her to provide the musical insights that make listening to this remarkable album all the more pleasurable.

'I think this is a first,' says Nikki. 'I don’t know of any other pop music academic who has been so closely involved in the creative process of making an album.' Perhaps she should have said a double first, as the record in question is also the world’s first album digitally produced and released as an app.

www.sheffield.ac.uk/music

'I don’t know of any other pop music academic who has been so closely involved in the creative process of making an album.'

‘It is an extraordinary story,’ says Sir Roger Bone, President of Boeing UK and one of the Prime Minister’s honorary ambassadors for manufacturing. He is talking shortly before he delivers the University of Sheffield’s annual Management Lecture and the subject has come round to talk of collaboration between industry and higher education.

‘The University of Sheffield and the AMRC were selected by Government as being the kind of kernel of the advanced manufacturing Technology Innovation Centres,’ he says. ‘This is added recognition of the excellent work they are doing.

‘The AMRC has grown considerably since it was established and now has partners developing new manufacturing technologies that enhance the competitiveness of British industry across a broad spectrum of sectors – not only aerospace – but also marine, automotive and medical.

‘It is difficult not to indulge in superlatives when one talks about the vision, and the realisation of that vision, by the University of Sheffield. The AMRC has done a terrific job – and is continuing to innovate and find new solutions.’

Sir Roger points out that the main reason the British arm of global manufacturer Messier-Bugatti-Dowty won the contract for the landing gear on the new Boeing 787 is because of the cutting edge technology that came out of the fusion between the University and industry.

‘So, in a way, things have come full circle,’ he says. ‘The investment by Boeing in Sheffield is now coming back into the company’s supply chain and that product, developed in South Yorkshire, is now playing a crucial role on the world’s most advanced passenger aeroplane.’

www.amrc.co.uk
Nikki Hilton is getting used to jibes about being able to ‘bore for England.’ The 23-year-old University of Sheffield postgraduate engineer is leading a research project that will transform the way key components in the nuclear industry are produced – virtually doubling the current record for drilling deep holes into stainless steel.

The challenge she has been set by her industry sponsors, Rolls-Royce, and by the head of the machining group at the Nuclear AMRC, Stuart Dawson, is to create a process that can not only drill to a depth of up to eight metres, but do so in a way that eliminates operator intervention.

“We want a completely green button process with zero human intervention during the process,’ says Dawson. ‘That means we need some kind of drill steering method so it can travel eight metres down this hole and arrive at the other end within millimetres of its target.’

Hilton knows the bar has been set high but as one of the new generation of engineers – her father is a physicist and her grandfather was an engineer – she relishes the chance to push back the boundaries of the possible and to set new standards for high value manufacturing in the energy sector.

‘I am excited to be involved in a project that is going to make such a big change and a big impact. The current industry limit is to a depth of 300 times the diameter of the drill bit. We aim to push that to 500 and to make the process more efficient, accurate and consistent.’

She added: ‘What we are doing will have an immediate impact on the nuclear industry, and have applications for oil and gas. I was really attracted to the research because it will really make a difference when it is applied to industry and I find that very exciting.

‘The environment at the AMRC and the Nuclear AMRC is fantastic. Everyone is very enthusiastic about not only their own research but about all the other research going on around them. People are very keen to try new ideas and to think outside the box. The fact that there is such a deep pool of knowledge and experience to draw on makes the challenge a lot less daunting.

We will have the support of the University, the AMRC, and also our industrial sponsor, Rolls-Royce, and this level of collaboration and cooperation gives us real confidence in what we are trying to achieve.’

This is a view shared by Hugo Lobato, the capability acquisition team leader for Rolls-Royce Civil Nuclear. He said: ‘Technology development in deep hole drilling for nuclear applications represents a once in a generation opportunity for the UK high value manufacturing industry. The collaboration between Rolls-Royce and the Nuclear AMRC will ensure that the project will challenge conventional manufacturing techniques and deliver a step change in the manufacture of components with large length-to-diameter ratios’.

Hilton is one of the first students to enrol in the University of Sheffield’s new Industrial Doctorate Centre (IDC) in Machining Science. A collaboration between the AMRC and the Faculty of Engineering, with the support of EPSRC and industrial partners, the IDC offers a four-year programme of fully funded training and research for up to 20 students per year.

Earlier this month Hilton and her team took charge of one of the largest machine tools in the UK — the TBT ML700 — and the largest piece of kit of its kind in any university. At 27 metres long, the machine tool is bespoke for this project and took two weeks to install in the new Nuclear AMRC building.

www.namrc.co.uk
www.amrc.co.uk/about/idc
Without them I couldn’t have done all the testing and got the feedback I needed to develop the products.

Wayne Austin, Managing Director, Ceramisys

Paul, who is now a Knowledge Transfer Champion within the University, is a biomaterials specialist with a keen interest in collaborating with regional and international private sector partners.

When Wayne first came to me he had produced one of the best porous ceramics I had ever seen and was beginning to produce it on a small scale in a city business centre’ said Paul. ‘This was the closest I had been to working with an entrepreneur and they are very different to other kinds of people I usually work with. He had real courage in starting a company and believing in his product.’

Ceramisys are in no doubt about the role the University of Sheffield is playing in helping them grow their bone graft biomaterials business from a small start-up enterprise to a million pound turnover concern in the Don Valley.

I couldn’t have done it without them,’ says Wayne Austin the 37-year-old Managing Director of Ceramisys. From the very early days, Professor Paul Hatton and his team were my virtual research and development laboratory. Without them I couldn’t have done all the testing and got the feedback I needed to develop the products.’

The pair began to work together using small grants to fund scientific and technical support, but it was out of this collaboration that the relationship developed. ‘The beauty of this is that we started with a couple of small grants, and from there Ceramisys went on to fund a case studentship; and from that we got a Technology Strategy Board grant to work in partnership with Nottingham University and York-based Smith and Nephew. So we have evolved and grown with them in a relationship where we recognise the skills and expertise of one another’.

In the ten years since Wayne contacted Paul – ‘I was a chemistry graduate at the university and knew of Paul’s reputation in biomaterials and dentistry’ – his business has grown to become a leader in the field, with more than 95 per cent of the company’s products going to export markets in Europe and the Americas.

‘The relationship has been mutually beneficial,’ says Wayne. ‘We have supported the funding of PhD students and we have been an industrial partner with the University in seeking European and other grant funding.

‘I think the relationship has also given Paul and the University an insight in to the world of business, in particular the demands that an entrepreneur faces in developing and bringing new medical products to market. We are constantly innovating to grow and develop the business.

www.ceramisys.com www.sheffield.ac.uk/shg
MIMOUN AZZOZU Joins exclusive club

The man leading the hunt for new ways of treating disorders of the central nervous system has joined the select club of European Research Council Advanced Investigators for his groundbreaking work on gene therapy for neurodegenerative diseases.

The award, worth €2.5m, was presented to Professor Mimoun Azzouz, who is Chair of Translational Neuroscience at the Sheffield Institute for Translational Neuroscience (SITraN).

The funding will allow his team to expand the horizon of translational research at SITraN, and enable them to gain a better understanding of disease mechanisms at the molecular and cellular levels in two devastating neurodegenerative diseases, Spinal Muscular Atrophy (SMA) and Motor Neurone Disease (MND).

‘I am delighted to be presented with this prestigious award. This is a wonderful achievement which will enhance the research capability and profile of my research team as well as neuroscience research in Sheffield,’ Professor Azzouz said.

‘This award offers a platform to reinforce SITraN’s European and international leadership in the field of gene therapy for neurodegenerative disease.’

DIGITAL REPLICA S Transform patient care

A 3D digital replica of a patient could soon be a reality as engineers, computer scientists, clinical researchers and practising clinicians collaborate to turn science fiction into a real world technology – transforming the way diseases are diagnosed and treated.

The treatment of patients will move from subjective assessment of 2D images of the coronary arteries to an era of complete, personalised, comprehensive, automated, 3D anatomical and physiological assessment, deciding in an objective way what the best plan of treatment for a specific patient should be,’ said Dr Patricia Lawford, Senior Lecturer of Cardiovascular Science at the University of Sheffield.

A three-month professional internship outside the lab will widen their experience of the areas of work in which they can apply their skills and training – including the challenges of energy and food scarcity.

Research collaboration between the universities of Sheffield, Leeds and York has received a £66 million boost to help train the bio-scientists of the future – giving them valuable real world experience outside the lab.

Dr Julian White, Chief Executive of the White Rose University Consortium said of the new joint Doctoral Training Partnership in mechanistic biology: ‘This initiative will create highly trained and adaptable students able to apply their skills to national and global challenges.

The new money will be invested in a collaborative Clinical Research Facility that will draw on the combined talents of research teams across the University and the Trust.

Source: The University of Sheffield Media Centre
sheffield.ac.uk/mediacentre

BRIEFING — Health & Well-being Special

£3.1 MILLION GRANT FOR Groundbreaking research

A longstanding partnership between the University of Sheffield and the Sheffield Teaching Hospitals NHS Foundation Trust has been awarded a £3.1 million grant to accelerate work on much needed treatments for diseases such as Motor Neurone and Parkinson’s.

The new money will be invested in a collaborative Clinical Research Facility that will draw on the combined talents of research teams across the University and the Trust.

Professor Keith Burnett, Vice-Chancellor of the University of Sheffield, said: ‘Our long-standing partnership with Sheffield Teaching Hospitals puts us in a very strong position to translate our world-leading research into benefits for patients.’

Sir Andrew Cash, Chief Executive of Sheffield Teaching Hospitals, added: ‘Sheffield has always been a pioneer in healthcare research and this is another example of excellent partnership working in the city, to forge ahead with translational research which takes important new developments from the laboratory bench to the patient’s bedside.’

Source: The University of Sheffield Laboratories. The University of Sheffield
HEALTHCARE GATEWAY

Industry access to leading medical research at the University of Sheffield is being made easier with the creation of a dedicated healthcare gateway staffed by professionals with wide business experience.

The Gateway – one of three recently formed at the University; the others being focused on engineering and science – is designed to stimulate the growth in knowledge exchange between the University and the private sector and to create an environment where this can flourish.

Professor Richard Ross, an endocrinologist who is the academic lead for the Healthcare Gateway and a director of two medical spin-off companies himself, said: ‘We have changed the infrastructure inside the University to make it much more accessible and industry-friendly. A team of dedicated business professionals are now the first point of contact for companies wanting to develop a relationship with the University that can help them bring a product to market.’

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Soon to return from a sabbatical at Singapore’s A*STAR Institute of Cellular and Molecular Biology – where one of his research teams is using zebrafish to study liver tumors – Phil’s early career led to a step-change in our understanding of how certain signaling pathways could mutate in multiple cancers, including many that are treatable if detected early.

‘Our role is to make this process as smooth as possible. We have really good links with the University’s two other gateways – in engineering and science – and have frequent formal and informal meetings to discuss on-going and prospective knowledge exchange activities with them,’ he added. ‘We might, for instance, find that someone who comes to the healthcare gateway really needs to talk to someone in materials science or biochemistry. Our knowledge of who is doing what within the University allows us to quickly identify the right contact.’

www.sheffield.ac.uk/shg

‘This is a great example of how the type of work we do can lead to the development of new drugs that can help the fight against cancer and other diseases.’

www.sheffield.ac.uk/bms

http://cdbg.shef.ac.uk

Our role is to smooth the process by which industry and other stakeholders can come together to develop medical treatments and technologies that have real world benefits.’

Professor Ross says that while the University of Sheffield has a proud record of developing medical spin-off companies, and of working closely with the private sector to bring new products to market, the new gateways will help the University maximise the benefits of collaboration with the private sector. ‘It enables us to use our expertise and research to help develop new products and new clinical therapies and technologies that will have real benefit to patients and the wider public.

Another aspect of making access easier for industry to develop and test new treatments comes with the formation of a Joint Clinical Research Office, involving researchers at the University of Sheffield and clinicians at the Sheffield Teaching Hospitals Trust. ‘This means we can act as a single organisation,’ said Dr Lapworth. ‘A company who wants to work with us to test a treatment or new drug doesn’t really care which organisation his collaborators are employed by. What our collaborators want is a simple and easy process that allows the research and tests to be carried out effectively.

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‘Our role is to make this process as smooth as possible. We have really good links with the University’s two other gateways – in engineering and science – and have frequent formal and informal meetings to discov...
Genetic modelling using zebrafish and fruit flies at the University of Sheffield is reducing the time it takes to bring new drugs to market by identifying how existing drugs can be used in novel areas – giving hope to patients suffering from inherited diseases that treatments will be found sooner rather than later.

Already researchers at the University’s MRC (Medical Research Council) Centre for Developmental and Biomedical Genetics (CDBG) have made a significant breakthrough in the treatment of Parkinson’s disease by screening fruit flies with a drug usually used to depress the immune system in transplant patients.

Lead researcher Dr Alex Whitworth said: ‘We were studying how two genes known to cause rare inherited forms of Parkinson’s (the PINK1 and Parkin genes) affect nerve cells in the brains of fruit flies. ‘Fruit flies with either of these mutations have damaged dopamine-producing nerve cells and problems with mobility similar to Parkinson’s. But we found that giving the fruit flies a drug called Rapamycin – usually used to prevent the rejection of transplanted organs – could protect the flies against the effects of mutations.’

Crucially, this study identified a key pathway inside nerve cells that can be stimulated to protect the cells affected in Parkinson’s.

‘It’s early days yet, and there’s a great deal of work to be done before we will know if these findings can be applied to all forms of Parkinson’s. But the discovery of this pathway reveals the exciting potential that genes hold for understanding Parkinson’s and developing drugs that could slow or even stop the progressive loss of nerve cells in the brain.’

Dr Kieran Breen, director of research and development with the Parkinson’s Disease Society, the main backers of the study, said: ‘This is an exciting new development in the search for new and better treatments for Parkinson’s. The discovery of this pathway may be the key to developing new drugs that could slow or even stop the progressive loss of nerve cells in the brain.’

Professor Philip Ingham, who set up the MRC Centre some eight years ago, says he was determined from the outset that the CDBG would be committed to collaboration and use focused and directed research to produce real-world treatments for diseases.

“When we first thought about setting up this centre I talked to a number of clinicians at the Medical School to see if they were interested in working with us on modeling diseases using the zebrafish,” he said. ‘I found that we were pushing at an open door.’

Collaboration with the Medical School is deepening the Centre’s interest in neuro-degenerative diseases as well as neuro-behavioural disorders using zebrafish as a non-mammalian model. The neuroanatomy of the fish brain is surprisingly similar to that of human and fish show a variety of behaviours analogous to human disorders such as anxiety, aggression and depression. Other research teams at the Centre are using zebrafish to study a diverse range of diseases, from chronic inflammation to bone tumours, as well as in a search for a cure for blocked arteries.

‘We are pioneering this approach in the UK,’ said Professor Ingham, who acknowledged that there is still some scepticism within the biomedical science community as to the validity of using fish as a model for human. ‘One of the great things about the fish is the ease with which they can be exposed to different agents, which means we can very rapidly screen many hundreds of existing drugs to uncover their previously unknown effects.

‘This has the potential to save millions of dollars or pounds that are needed for the conventional process of developing new drugs de novo. It saves valuable time in lengthy clinical trials. It means you don’t have to do phase one trials because these have already been done – the drugs are already in use and have been approved. This is a very important benefit to the patient, since it greatly reduces the time it takes to get a drug approved.

http://cdbg.shef.ac.uk/
Senior civil servants from the Treasury, the Department of Health, the Home Office and the Behavioural Insights Team heard evidence from University of Sheffield experts on a bold new initiative to tackle the epidemic of binge drinking.

Researchers at the Sheffield Alcohol Research Group (SARG) whose work on minimum unit pricing has already led to a dramatic shift in alcohol policy north of the border in Scotland, revealed how their model supported a shift in Government tactics to target the price of cheap drinks in the battle against alcohol abuse.

Shortly after the Cabinet Office summit, the Government announced that it was planning to set a minimum price for a unit of alcohol, with 40p a suggested level, in a bid to deal with a problem that is estimated to cost the health service £2.7 billion a year. It is estimated to cost the health service £2.7 billion a year.

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‘It appears that David Cameron’s team has looked at this evidence and are convinced that minimum pricing could make a difference,’ Dr Holmes said. ‘The seminar at the Cabinet Office was attended by all the relevant departments. We were able to use our model to show the effect of different levels of minimum unit price on behaviour, and how it was a well-targeted policy that would reduce both alcohol consumption and the harm it causes.’

The SARG model is the most detailed and sophisticated of its kind and looks at how shifts in policy can affect different groups within society – ‘this hadn’t been done before,’ said Dr Holmes. ‘Our evidence has been a big part of the story in the shift in the approach to this issue.’

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International design guru Sebastian Conran is working closely with academics at the University of Sheffield to create the next generation of a computer software package that is transforming the lives of elderly people and patients. The collaboration is being supported by a new ‘Designer in Residence’ scheme funded by the Engineering and Physical Sciences Research Council (EPSRC).

Building on the success of the Managed Access to Audio Visual and Information Services package – or MAAVIS to her many friends – researchers at the recently formed Centre for Assistive Technology and Digital Healthcare are building a new system that will work on any computer platform.

To create such a universal system that is simple to use and easy to understand, presents complex challenges for the researchers, but the trial of MAAVIS at care homes in the Yorkshire region has convinced them the effort is worth it.

Dr Peter Cudd, who is masterminding the project, said: ‘MAAVIS opens up lots of opportunities for social interaction, but it also has more specific health benefits. People with dementia retain their language skills the longest so they can access songs or talk to family. They can still interact. For stroke victims we can put speech-therapy exercises on to their programme so they are backing up the work of the speech therapist to speed their recovery.’

His work is just one aspect of health related research being undertaken by the new Centre which is breaking new ground in other fields of assisted living. The Centre is a focus for research into new technology for people with disabilities, older people and people with long-term conditions, bringing together and co-ordinating the input of more than 30 research and clinical scientists with expertise across healthcare, engineering, social science and science. The aim is to assist people to live independently at home for longer without need for hospitalisation or care institutionalisation. www.shef.ac.uk/scharr/sections/hsr /rg/catdh

http://malt.group.shef.ac.uk

Managing the Technology Strategy Board funded MALT project is Tim Ellis, previously the Department of Health’s policy lead on telehealth, who says the team is working with the NHS to discover ‘how to mainstream telehealth services and to understand what approaches work well and what obstacles there are to delivering new services rapidly and at scale. We can then put in place projects to address the barriers.’ He added that: ‘The final phase of the project will involve us creating tools and techniques to capture and disseminate what we have learned on the project to colleagues in the NHS.’
For David this work is the fulfillment of an ambition to 'make an impact on policy' and it grew out of an extended sabbatical that enabled him to gain a deeper understanding of the way Defra worked and the issues that were of most concern to its senior management.

David says ‘It was a pleasure to be able to use my knowledge to help Defra make a commitment to tackle such a deep rooted environmental problem, and I am looking forward to conducting research which is focused on helping to solve part of it’.

Senior environment officials in Whitehall who are trying to combat the unregulated urban and industrial pollution of rivers are gaining new insights into how to tackle the growing problem through a novel collaboration with a team of experts at the University of Sheffield led by Professor David Lerner.

David, who is the Director of the University’s Catchment Science Centre, spent a six-month EPSRC sponsored Knowledge Transfer Account (KTA) Industrial Research Sabbatical (IRS) with Defra helping them gain a deeper understanding not only of the scale of the diffuse water pollution problem but also of how to control it.

Richard Martin, who leads the Whitehall team looking at diffuse water pollution for the Environment Agency and Defra said: ‘David’s help in pushing forward our approach to dealing with the complex and intransigent problem of non-agricultural diffuse pollution has been invaluable. He has brought clear thinking, rigour and a fresh perspective. We would have made nowhere near the progress we have without his input and we are very grateful for his contribution.’

Indeed, Defra acknowledge that David was instrumental in helping them secure a high-level Government commitment in last year’s Natural Environment White Paper ‘to developing a strategy to identify and address the most significant diffuse sources of water pollution from non-agricultural sources.’

David’s work with Defra captured the current scientific and engineering knowledge on diffuse urban pollution; identified key gaps in that knowledge; and developed a research strategy for stakeholders to fill the gaps.

Now David and his colleagues Peter Bibby, Andrew Philips and Brenda Chisala are completing a scoping study into whether the run-off from countless trading estates is harming the natural environment.

David said: ‘The occupiers of smaller light trading estates have not been considered a high risk in the past, but the cumulative effect of industrial discharges from these sites is now being recognised as a challenge to regulators.

‘Our scoping study has mapped all the trading estates in England and provided an estimate of the risk of pollution from each estate, and an assessment of whether these risks can be related to water quality.’

The team has already identified 95 pollutants and more than 20,000 occupiers with pollution risks. David says the next steps would be to validate the trading estate map, conduct field visits, assess the risks in detail, and to target a sampling campaign in a test area.

‘We would then be able to refine our methodology using the new data, finalise our mapping and identify priority catchments and sectors. We could also then develop the most appropriate monitoring strategy.’

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www.ursula.ac.uk
One of the country’s leading nurserymen is diversifying his business into the green roof sector through a three-year collaboration with experts at the University of Sheffield – and is already about to bring new products to market, just half-way through the project.

Tim Edwards, Managing Director of the Midlands-based horticultural firm Boningale, said he first contacted the University’s Green Roof Centre because of its ‘world wide reputation in the field.’

‘At that time I had a clear idea of developing a single product, a modular system that could be used when installing a green roof,’ Tim said.

To do this, he approached Jeff Sorrill, who heads the Green Roof Centre, about establishing a Knowledge Transfer Partnership (KTP) and an external candidate, Maggie Fennell, was taken on to develop and manage the project.

Maggie’s initial market research, however, showed that while there was demand for a modular system, other products were more urgently needed and might be easier to develop. ‘Very quickly we realised that the substrate – or the growing medium – was a key element in the performance of a green roof,’ Tim added.

As a result, Maggie was able to look at developing a plug-grown product that is the first fit-for-purpose plant for a green roof. ‘We now have a product that is ready to launch. Astonishingly, it is the only plug which is designed to thrive in a green roof situation,’ said Tim.

With the new product about to go to market under the brand name of Skyplugs, Tim is also looking at developing a range of substrates that will deliver different solutions in different environments. ‘We now have a PhD project underway that will publish research into the different benefits of a green roof.

The results of this study will make it easier for green roof users to get a very tight handle on what they want the roof for; what benefits they hope to get; and what elements they need to have in place to achieve these benefits.’

He said that people want a green roof for a variety of reasons: some want it as a water attenuation system, while others want to increase biodiversity. Each of these would require a different approach and what Boningale is working on is an evidence-based system that is easy to understand for the green roof industry.

‘The relationship with the University has opened up a whole new line of activity for us,’ Tim said. ‘Before Maggie came we were a grower, supplying plants to the amenity markets, whereas now I can see us becoming a supplier of plants and substrates to the green roof market and that is a completely new product range and plant element for us.

‘All three parties have really benefited from this relationship. The University is doing good scientific research which will result in published papers, we are developing commercial products, and Maggie has really grown in the role,’ said Tim.

‘A very important part of a KTP is getting the right person for the job and that can be difficult, particularly in a project like this – it would have been easy to fall in to the trap of selecting someone who understood plants, but what we needed was someone with quite broad capabilities. In the beginning this was very much my project, it was an area I wanted to develop to see the business diversify. What Maggie is doing is effectively setting up her own business; she has done all the background work. She is now the expert. She is the one looking at how we package and promote the new products; and how we take them to market. She is really coming in to her own.’

www.thegreenroofcentre.co.uk
A DAY IN THE LIFE
— Allan Pacey

A regular commentator in the broadcast and print media, male fertility expert Dr Allan Pacey combines a busy academic career with work in the Sheffield Teaching Hospital's Jessop Wing.

6:00am
The iPhone wakes me earlier than usual. I'm not a morning person. Five Live want me to talk about a new report into the decline in male fertility. I spent last night talking to colleagues, bouncing ideas off them. I don't rehearse, but have phrases I can call on. This doesn't faze me. As we are publicly funded, I feel we have a duty to explain what we do.

6:30 – 7:45am
I put the coffee on and take a long shower before the short drive to the BBC Radio Sheffield studios: they should give me a staff badge, I am here that often. I sit alone in a booth and call Television Centre. There is nothing glamorous about this kind of media. I check the iPhone and quickly post a tweet. The interview goes well. Last night's preparation has paid off.

8:00 – 10:00am
Park the car at home. It won't be needed again as I walk to the University. I have an office at home – the back bedroom – where I work before going to the hospital. I skim emails, dealing only with the most important. Still no breakfast – normally this is a bowl of porridge and Golden Syrup – but there is plenty of coffee. Free of distractions, I work on a paper. I like to construct a convincing argument with a beginning, middle and end. Having honed my own paper I look at those of my PhD and post-doctoral students. This helps them understand the process of writing and communicating.

10:00 – 10:20am
It’s still wintry outside: a brisk walk to the hospital.

10:30 – 11:00am
My desk is littered with papers, but is more ordered than it looks. I am still buzzing from the radio broadcast, but am brought down to earth with a bump. My chair of 11 years decides to call it a day, leaving me on the floor in an embarrassed heap. No one has seen me. I take the broken arm (of the chair not me) to the lady who keeps the accident book and ask for a new chair. I check the post and catch up with my PhD students. Jack isn’t in, but I track him down to the lab. His results about sperm metabolism are very exciting.

11:00 – 12:00
I leave Jack and head to the Andrology Clinic. Deborah lets me know everything is running smoothly. Many of our patients have cancer and want to bank their sperm before undergoing therapy. I see a 14-year-old boy. There are sensitive issues to discuss, but I win his trust. We will keep in touch with him for the next 30-odd years. I have good news for him. His sperm is healthy and popped away in storage. I sign legal documents for Deborah and head off to lunch.

12:00 – 1:00pm
No lunch. My iPhone reminds me of another meeting, this time it's about the MSc Science Communication course I run. I’d forgotten that a physicist who is making a film on solar cells wants to see me about contributing to the one-year course. The hour flies by, but I have only had a cup of tea (I make it a rule not to drink coffee in the afternoon).

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1:00 – 3:00pm
Back to the office and a message from the head of the department. I nip to see him and find he wants me to run a committee. Another ball to juggle, but you don’t say no to your boss. Then it’s back to the grant application. This is a quiet time of day and ideal to get on with some serious thinking and writing.

7.00 pm
Back home to the pea and ham soup I had prepared yesterday. As a news junkie I tune in to News 24. I pour a glass of malt before dipping into Essential English by Harold Evans – the former Sunday Times editor. Looking forward to a slightly later start tomorrow.

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Issue 02 — We’ll be discussing the environment, philosophy and additive manufacturing.

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