As part of the 25th anniversary celebrations there will be a series of events and lectures happening throughout 2009. During Convocation Weekend, on Friday 3rd July, Computer Science staff and alumni have been invited to a drinks reception, meal and live music in the beautiful setting of Goldney Hall overlooking the Cumberland Basin, Clifton Suspension Bridge and the Avon Gorge.

In honour of the very first Head of Department, Computer Science is launching the Mike Rogers Scholarships which will provide ten scholarships for home/EU students worth up to two thousand pounds each over the course of the degree. There will also be a series of talks and lectures throughout the year, the first of which, 'Is Privacy Possible in the 21st Century', was held at the Watershed on February 12th.

News and up to date information on all our plans for the year can be found at: http://www.cs.bris.ac.uk/25/

Computer Science kicked off their 25th anniversary celebrations this year with a party for students, staff and alumni. The atria of the Merchant Venturers Building (home of the Computer Science department) were transformed with lights and decorations as well as a bar and casino installed especially for the occasion. The Department is well known for its informal and friendly atmosphere but members of the department made a special effort to look the part for this glamorous occasion. DJ's were dusted down and shoes polished as over 170 guests came to drink champagne, listen to jazz, play roulette and black jack at the casino before dancing the night away.

Nishan Canagarajah, Head of Department said, “I had never imagined you could see so many ‘smartly dressed’ computer scientists having such a good time. The decorations and the atmosphere in the atria were simply fabulous. My thanks go to everyone who worked so hard to make the evening such a memorable one.”
LynchPin Spring 2009

LynchPin is produced termly by the Faculty of Engineering, University of Bristol

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Design and production
Carrie Wattling

Print and reproduction
Portishead Press Ltd
Printed on Revive 75% recycled paper stock using vegetable based environmentally friendly inks.

Cover: CGI of the tidal stream device being built by Tidal Generation Ltd

LynchPin is available online at www.bris.ac.uk/engineering/staff/publicity/lynchpin
Well, after seven years of toil and anticipation, the Research Assessment Exercise arrived heralded by a fanfare of trumpets – followed by “what now?”. But, let’s just pause there for a moment. The RAE showed that Engineering at Bristol can operate at the highest level. 73% of our research activity was rated as world leading or internationally excellent – this was achieved across the board. This places us in the upper echelons of UK engineering research centres. We should be proud of this achievement, but as always not be complacent. Sure enough we haven’t been: in the last few months we have been awarded £12m in two doctoral training centres, one in Composites and the other in Systems, underpinning these areas for another eight years. These doctoral training activities join the Complexity centre as a hub for large scale internationally recognised research. Thus, we move on with successes under our belts which bode well for the future.

In teaching, our students never cease to amaze me, showing flair and perception in areas I would not have countenanced as a student myself. Yet again our Engineers Without Borders students have gone out and spread the word through their good deeds around the world including Cuba and India last summer. The most peculiar experience of the year so far also relates to students. At the August admissions meeting we were full. This might seem an odd thing to remark upon, but this is the first time it has ever happened in Engineering at Bristol – and I know from colleagues at other Universities it is an experience not readily encountered in our discipline. Our admissions tutors have done us proud here, as a strong intake of intelligent and motivated students is at the core of everything we do: it makes teaching interesting (and challenging!) and means our students leave us knowing they have been educated alongside the best of their generation.

Of course, it is not all a bed of roses. It would be impossible to write an article about the state of affairs in the Faculty without making reference to the global financial situation – and unfortunately we are not immune. A significant proportion of our research is with industry and the University is rightly committed to developing our infrastructure for the long term, and this comes at a cost. As everyone will have realised this is a tough environment to keep in balance. The pressure to reduce costs and increase income is like nothing I have seen in Higher Education. The solace I take from our current situation is that we could not be better placed to meet this challenge. The RAE has put us in a healthy position from which to develop our international standing and our students are just fabulous.

Yes, there will be change, but we are in the fortunate position that we are not considering change to survive, but change to allow us to continue and grow our success. As they say, “onward and upwards”. Let’s hope the trajectory is in a relatively straight line!

Professor Nick Lieven
Dean of Engineering
The latest news and events from around the Faculty

Catherine Mitchell, Professor of Energy Policy in the Department of Geography at Exeter University presented the 2009 Annual Garrad Hassan Renewable Energy Lecture in Queen’s Building in January this year. Catherine has advised numerous national and international companies, NGOs and institutions on the transition to a sustainable energy system.

The talk was arranged to coincide with the Faculty’s new Masters Level teaching module on ‘Engineering Design for Wind and Marine Power’, directed by Dr Askin Isikveren, which featured strong input from Garrad Hassan along with other sector leading companies such as Wind Prospect, Tidal Generation Ltd, Xero Energy and RWE npower. The lecture was attended by over 200 people.

The Royal Society has chosen the “Dento-Munch” research project for its 2009 Summer Science Exhibition in London from June 30th to 1st July. Experts from the Mechanical Engineering department (Drs Kazem Alemzadeh, Andrew Harrison and Daniel Raabe; PhD student) and the Department of Oral and Dental Science (the Bristol Dental School and Hospital; Dr Tony Ireland) have copied a human bite to robot jaws to test dental materials and components. The group has developed a lightweight clinical dental brace to record human chewing motions. The dental brace records the mandible movements such as opening, closing, protrusion and laterotrusion using a Vicon optical motion tracking system based in BRL.

This collaborative research venture is supported by the Doctoral Training Grants until September 2009.

Last Autumn an unusual visitor set up home in the branches of a tree near the Electrical and Electronics workshop in Queen’s Building. This new arrival was greeted with great excitement by the workshop staff but with disdain by the local population of crows, jays, magpies and squirrels. A European Eagle owl, the largest owl in Europe, had come to stay!

The owl quickly became a celebrity and twitchers (not the electronic kind) came from all over the region to take photographs. The workshop staff named him ‘Old Brown’ following the Beatrix Potter tradition of giving human qualities to the animal kingdom. Old Brown soon attracted the attention of the media, putting on a display for a blog in the Guardian, making the HTV evening news and featuring in the BBC’s Inside Out programme, which followed the bird while it was hunting.

There is much speculation as to why the owl took up residence and where he came from. Eagle owls are not native to this country so the likely reasons for his being here are that he flew in from the Continent, escaped from captivity, or is from the small colonies of breeding owls recently established in Yorkshire and Scotland.

Old Brown had been roosting in the sycamore until just before Christmas but since then has only been seen a few times. He can, however, be heard hooting in the evening around 7pm. Maybe the spring will see the return of Old Brown to his tree where he can continue to be enjoyed by all (except of course the local wildlife).

Ivan Laver, Central Workshop Manager, retires this term after spending 38 years in the Faculty. Ivan joined the Mechanical Engineering Department as a Technician in 1970. He quickly became an important part of the Materials testing team and became the Deputy Superintendent for the Mechanical workshops and teaching/testing labs in 1984. Ivan has seen many different teaching and research projects in his time and one of the largest was producing the drive train for a wind turbine for the Windward Boat project. Well someone had to travel to Guernsey!

Ivan became Central Workshop Manager in 1999 and was responsible for the setting up of the Central Workshops as we all know them today. The development of the BLADE facilities was an important boost for the Faculty of Engineering and much of the current superb manufacturing facilities are the direct result of Ivan’s hard work and drive.

Ivan has also been an integral part of the Department’s social scene, being a keen member of the skittles, squash and, until very recently, the cricket team. Ivan has also found time to develop his favourite hobbies of fly fishing and shooting. He will now have the opportunity to stand waist deep in freezing water casting his fly for trout – that is when he’s not on a cruise or visiting his friends in the sunny state of Texas, USA.

We all wish Ivan and his wife Vanessa the very best in his retirement and send our thanks for all the hard work he has put into the Mechanical Engineering Department and the Faculty over these last 38 years. It is indeed the ‘end of an era’.

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Well done to the portering staff in MVB who have singlehandedly raised £300 for Children in Need. Dave Brown, Steve Curry and Ed Collins sported a variety of costumes, to the huge delight of everyone who donated!
The Advanced Composites Centre for Innovation and Science brings together activities on composite materials and their applications across the University, linking research in Engineering to the Science and Medical Faculties.

The work encompasses both computational and experimental approaches and spans a broad spectrum from the development of novel materials, investigation and modelling of fundamental material and structural behaviour through to design and manufacture of structures using advanced materials and concepts.

ACCIS has strong links with all the major organisations engaged in the development and exploitation of composite materials and products. ACCIS was launched in April 2007 to bring together the composites research activities and has grown very substantially since then.

It became clear very early on that the ACCIS concept was attracting a significant level of support from across the industry and that the laboratory and office facilities would not be adequate to cope with either the expected growth in staff or the expansion of the experimental activities. Major additional contracts such as the recently awarded £7 million Doctoral Training centre have merely underlined the correctness of that early appraisal.

A specification for the expanded facilities was developed which focussed on the need to maintain the cohesion of the ACCIS activities as they grew. The extension to the Structures Labs offers everything we were looking for in the new ACCIS facilities.

At the lab level we will have a new open lab area of the same size as either of the two Blade labs, plus a large area of refurbished space brought into use. This will offer the highest standards of flexible, modern, heavy duty laboratory space to attract both the best researchers and the most influential companies to work with ACCIS, with a focus on the further development of our composites manufacturing theme.

Immediately above and directly linked to the laboratory will be an office area built to equally high standards. These offices could accommodate up to 100 staff and students in a mix of individual offices and open plan areas, with a mezzanine floor and several break out and meeting rooms offering the maximum flexibility.

The enabling work to prepare the site for construction has already started with the removal of trees and relocation of services. The University is currently finalising the contractual details with the contractors and it is anticipated that they will start on site from mid-late March 2009 with the building works scheduled for completion in early Spring 2010. A plan is being finalised with departments to decant colleagues and facilities directly adjacent to the build that will be disrupted by noise from the construction. Full details along with further information and updates on the building programme will be available on the Faculty web site shortly.

The next year is likely to be difficult as we have to work around the new facilities being built, but the new labs and offices will allow us to continue the growth and success of ACCIS into a secure future.

Kevin Potter
Bristol Red for Hannah

Hannah Mills has been awarded a Bristol Red as an individual who has produced exceptional performance in their respective sports at a level of achievement and commitment beyond that normally associated with University 1st team play.

Hannah, (20) an undergraduate in the Mechanical Engineering department is one of Britain’s most promising young dinghy sailors whose long-term goal is to win a Gold medal at the 2012 London Olympics. She first took the world of sailing by storm by winning the girls Optimist World Championships in 2003 and finishing overall with the best result Britain has ever had.

Her talent has subsequently been tested in the highly competitive double-handed, International 420 class where, paired with crew Peggy Webster, Hannah has continued to excel. One highlight of her career to date was being selected to represent GBR at the ISAF Youth World Championships in 2005. The following year the girls won the 420 Open Ladies World championships.

At the end of 2006 Hannah, now too old for the Youth class, moved into the International 470. This is the Women’s double-handed boat, which has been chosen for the London Olympics in 2012. Hannah joined forces with Katrina Hughes and very soon they were producing noteworthy results and winning the 2007 Junior 470 European Ladies title.

2008 has also had its successes with the girls winning the 470 Junior World Championships (under 22) and winning the silver medal at the Junior 470 Junior European Championships in Croatia this summer. Earlier in the year they managed a top 10 result at the Princess Sofia Olympic regatta in Palma del Majorca. Here they were competing with the Olympic competitors from many different countries.

As a result of their continued success and dedication the girls were invited out to Qingdao to train with the Olympic team at the end of June.

Hannah is also one of the “Athletes” that the London Evening Standard are following on their journey to the 2012 London Olympics. Each year they are writing at least one individual article on this group. She has recently been interviewed by Radio 5 Live and BBC Wales on her thoughts about sailing towards 2012, the results form Beijing and how she manages to fit in her education.

Product design of the future

What do the Stanley knife, Le Shuttle trains and BT kiosks all have in common? They were all designed by a company in the Midlands where George Cave is enjoying his 12-month industrial placement.

DCA Design International is a product design company based in Warwick, a town more famous for its castle situated just across the road from our offices. Product design is an area I knew little about before working for DCA, and I was definitely sceptical about the engineering required to work in a design-based environment before joining the company.

In reality, product design is an industry full of engineers, all of whom are critical to the success of the projects. DCA design and develop products in markets as diverse as consumer products, medical devices and trains, all of which require the problem solving skills and mechanical, electronics or software aptitude that an engineering degree gives you.

In contrast to my exposure to more “traditional” engineering companies, I have found the pace of work to be much faster. Project stages are often measured in days and weeks rather than months and years. This has provided me with the chance to gain experience in multiple areas and work on many different products over the course of a year. The last month has seen me designing a steel mock-up of a train cab, simulating airflow around trains and re-designing control panels for an industrial truck.

One of my first projects was a study for one of the world’s largest pharmaceutical companies to generate new concepts for drug delivery devices. Many of these ideas are now in the process of being patented, with those I designed or worked on bearing my name as a contributor. The rapid turnover of projects has also given me the chance to get involved with user trials and product testing.

So what can I conclude from my placement so far? Industrial experience is invaluable, it’s a message re-iterated time and time again but it also happens to be true. The opportunities to work on real products, make contacts and discover what working in industry is really like cannot be gained at University. Product design is an area well worth considering, especially if you have any interest in working on brand new projects, in a wide range of sectors and seeing them through from conception to production.

George Cave
3rd year Engineering Design MEng
New Year! We would like to thank the Faculty and Academics willing to supervise these projects. Please e-mail bristol@ewb-uk.org with any suggestions. The overall prize winner in the 2008 EWB photo competition was Joe Mulligan, taken by Joe Mulligan in Soweto East. This project aims to achieve.

Paul Anslow graduated with a degree in Civil Engineering last summer, and spent the following three months living deep in the Indonesian jungle on a voluntary placement organised through EWB Bristol Outreach. Paul was working as part of an established NGO team for a rural road construction project on the small tropical island of Nias, which was recently devastated in the Tsunami and Earthquakes of 2004/05. The aim of the 500,000 Euros project was to construct a 13km road connecting remote villages and providing better access for schools and markets.

When my EWB project partner and I arrived, the project was well behind schedule. Being the only foreigners in the remote location, we were essentially put in charge of the project and, with our combined road construction experience of zero, set to work to improve the operation.

So things are looking very positive for the New Year! We would like to thank the Faculty of Engineering for their invaluable support, and of course the wonderful base of students that has brought us to where we are now.

We hope that we are sufficiently equipped to show others the vision of the future that EWB aims to achieve.

Ben Kyriakou

Paul Anslow

The past few months have been busy ones - after much anticipation our Outreach team brought two presentations into local schools, ‘Water for the World’ and our own ‘Solar Car’ project. Response has been overwhelmingly positive from both staff and students, and we will continue running these throughout the year.

After sending eight students away on placements this past summer, we’re aiming for even more successful applications this year. With a launch day in the near future, everyone will be encouraged to apply for what is always a rewarding experience. The combination of a development engineering project in a real-world situation is just too good to pass up!

Our widespread publicity has also brought many exciting opportunities our way – last term’s Photo Exhibition launch attracted a wide variety of professionals, one of whom has proposed a very exciting placement which will be made public later this term. We’re also gearing up for hosting the EWB National Conference in October in conjunction with the Faculty of Engineering.

To stimulate increased links between EWB and faculty research in the lead up to this prestigious event, we are keen to promote development related undergraduate research projects for the 2009/10 academic year. Therefore, any ideas for projects in areas such as Water and Sanitation, Sustainable Construction Materials and Micro-Renewables would be greatly appreciated, especially from academics willing to supervise these projects. Please e-mail bristol@ewb-uk.org with any suggestions.

We hope that we are sufficiently equipped to show others the vision of the future that EWB aims to achieve.

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Paul Anslow

After a very successful year in 2008, EWB Bristol is moving forwards with a new committee and an increased drive to enable students to learn about development engineering – with over 400 members we aim to involve as many of them as we can in our activities.

Paul Anslow graduated with a degree in Civil Engineering last summer, and spent the following three months living deep in the Indonesian jungle on a voluntary placement organised through the student charity, Engineers Without Borders.

Paul was working as part of an established NGO team for a rural road construction project on the small tropical island of Nias, which was recently devastated in the Tsunami and Earthquakes of 2004/05. The aim of the 500,000 Euros project was to construct a 13km road connecting remote villages and providing better access for schools and markets.

When my EWB project partner and I arrived, the project was well behind schedule. Being the only foreigners in the remote location, we were essentially put in charge of the project and, with our combined road construction experience of zero, set to work to improve the operation.

My primary tasks over the three months included the accurate mapping of works to be done along the entire route of the road, the calculation of time & cost estimates, presenting improvements to the donor, designing more efficient methods of construction, and training local staff in these new techniques. I also supervised the construction of a 10-metre coconut log bridge that, despite knowing very little about, turned out to be a great success!

I personally have gained immensely from the experience: from the confidence boost of being thrown in the deep end and surviving, to new personal skills such as a conversational fluency in the Indonesian language. I was also honored to be the first foreigner to play in the traditional (and very serious) football competition in the lead-up to Indonesian Independence Day, which attracted a lot of the attention from the locals – at least until I broke my big toe in the semi-final!

Having travelled extensively in previous holidays, I honestly cannot imagine how a young Bristol graduate can spend a more worthwhile, memorable and altogether exciting three months of their summer break. I hope that both the Civil Engineering course and future EWB placements continue to inspire and fulfill enthusiastic young engineers’ desires for exploration and adventure.

Paul Anslow
Valencia - a year abroad

Ben Buxton reports back from Valencia, a city on the eastern coast of Spain known for its oranges and lately its Formula 1 racing circuit, where he is spending a year abroad as an Erasmus exchange student in the School of Telecommunications at the city’s Polytechnic University.

The university is much larger than Bristol, serving some 40,000 undergraduates and located on a town-sized campus with shops, banks and restaurants all on site. Students are encouraged to use sports facilities ranging from football pitches and tennis courts to an Olympic-sized pool, rock climbing centre and even a velodrome.

The equivalent to an engineering degree in Spain lasts a minimum of five years, with most students taking six or seven. Each academic year is divided into two four-month blocks, or cuatrimestres. The final cuatrimestre is occupied by the student taking a practica, about which the student bases their final dissertation. This can either be a practical project working with a research group in the university or a placement with a company. The examination system has the student facing exams at the end of each cuatrimestre. These are tough times as there is no revision period between classes ending and exams beginning. Most exams consist of an initial multiple-choice part to test on factual elements of the course, followed by problems requiring full written solutions. The multiple-choice test may sound an easy option, but even the professors here agree they are notoriously difficult! Wrong answers carry negative weight, and the questions are designed to trick the student.

I can say already the experience has been worthwhile; studying in a foreign culture is a real test of mettle, and getting to know people from not only Valencia but all over Europe is an enriching opportunity.

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Internship at Airbus UK

Chris Chown decided to take some time out between his third year study abroad and the final year of his degree to work for Airbus UK at Filton. I was recruited as an Aerodynamics Engineer intern into the Aerodynamic Data for Loads group. This group is part of the Aerodynamics department which falls within the Flight Physics sphere, and is responsible for high-speed aerodynamic loads modelling in the UK.

I was mainly involved in generation of aerodynamic data for the new Airbus wide-body twin-jet, the A350 XWB, due to enter service in 2013. This aerodynamic data is used to define the loading on the aircraft, and so has a direct impact on the sizing and weight of the aircraft. I collaborated with various engineers, using a combination of wind tunnel test data and computational fluid dynamic results, to model the aircraft high-speed aerodynamic load characteristics, and from this produce aerodynamic loading data for different aircraft configurations. These high-speed configurations consisted of different combinations of flight control deflections. I was also responsible for issuing preliminary advice for the A350 XWB wing leading edge high-lift device seal pressure ratios, which are used in determining the aerodynamic loads on these devices.

My year in industry provided an excellent opportunity to work with a fantastic group of people, who possessed a huge knowledge base, on a major aircraft programme. I gained a significant amount of knowledge in my year at Airbus UK, and enjoyed the experience of seeing how it’s really done in practice!

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International Development Design Summit

During the summer of 2008, Engineering Design student Hayley Sharp took part in the International Development Design Summit (IDDS), held at the Massachusetts Institute of Technology in Boston. IDDS is a month-long collaboration that brings together people from around the globe to build technologies for communities in the developing world. It isn’t strictly an academic conference or a technology workshop - the emphasis of the summit is on working to produce prototypes that can be used worldwide and focus on the needs of the world’s poor.

A large part of the time at IDDS was spent in smaller groups working on specific projects, ranging from charcoal crushers to power generation methods and $10 computers to low-cost medical devices. Alongside the design project, we had a lecture series covering the design process from conceptual ideas to business plans, talks from a range of guest speakers, and many opportunities to work and socialise with the other summit participants from around the world.

Throughout the Summit, I worked on a system to help provide more people with access to medical diagnostic testing, particularly those in rural communities in developing countries where disease misdiagnosis, the inability to monitor long-term illnesses, and poorly trained healthcare workers all contribute to the need for simple, accurate diagnostic methods.

I made an amazing set of friends throughout the conference, and was able to learn a huge amount from them. The difference in perspectives was incredible - for example I was working with a community health worker from Guinea on the hand-held medical diagnostics project, who was able to explain to us the real impact the product could have on people in his local community.

Thanks to the Bristol University Alumni Foundation and the Engineering Design course for their support.

Hayley Sharp

This summer, IDDS will be hosted by the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana, and Hayley will be returning to help organise it. For more information on IDDS see: www.iddsummit.org
Two undergraduates, Peter Symes-Thompson (Aerospace) and Toby Chew (Mechanical) are looking into starting a Bristol University Hovercraft racing team.

They both currently race hovercraft at national and international levels and have also designed and built their own craft.

Hovercraft racing is a unique motorsport right at the boundary of flying. The hovercraft are lightweight, single seater craft about the size of a small car. They race on courses that are a mix of land and water, often with jumps in between. Top Formula 1 craft reach speeds of 80-90mph and hovercraft don’t have brakes!

At the moment Bristol has nothing like a “Formula student” team where students’ designs can be put to the test in a competitive environment. Hovercraft racing is something a little different with a large scope for innovation since it’s still a developing sport. Unlike Formula student, it is possible to produce a craft that has the edge without a massive budget or outside help.

Within hovercraft racing there are many relevant technologies being explored including noise reduction, composite structures and ducted fan systems. A ‘noisecam’ has been developed to find sources of noise and help design more efficient hovercraft and fan systems. Hovercraft need to be lightweight; the top craft are high tech composite sandwich structures. With similar subjects at the top of the agenda at Bristol, we have the know-how to create one of the most advanced craft on the grid.

However it’s not all about the craft, you need to be able (and stupid enough!) to drive them. In our team there would be chances to race the craft you have helped put together. Being an active team, we would be affiliated with the Bristol Motorclub as the University karting team is.

Hovercraft racing is divided into various formulas, predominantly driven by engine capacity from Formula 35 (35Hp 4-stroke) to unlimited Formula 1 (240hp 2-strokes). Engines used are industrial 4-stroke engines for lower powered junior craft and high-powered motorbike and snowmobile racing engines for the faster ones. The fans are typically axial air-conditioning fans and craft can have one or more depending on the configuration.

We would race in the UK championship and could also be involved in European championship events and World Championships. Formula 2 or 3 would be ideal craft to aim for as a university team (there are already two universities competing).

For more info see www.camracing.co.uk and if you want to get involved send an email to tc8224@bristol.ac.uk

Peter Symes-Thompson
Toby Chew
The future is brite

The BRITE Futures Institute is a multi-disciplinary research hub dedicated to environmental systems and technologies. It encompasses a range of research activities linked to sustainable development, meeting the needs of today’s society whilst preserving the environment for future generations.

Although the University has a wide range of strengths linked to sustainable development and environmental technologies, existing activities could be significantly enhanced through greater collaboration between departments and with local industry. BRITE (BRistol Technologies for the Environment) aims to draw these existing strengths together under a single umbrella, developing new inter-disciplinary research projects and improving communication with funding bodies, external organisations and the general public. Activities will be grouped under six overarching themes:

- Global Change
- Water
- Energy
- Transport and Communications
- Built Environment
- Hazards and Risk

Core areas of expertise in Engineering to be embedded in these themes include Materials, Energy Management, Dynamics, Mathematical Modelling and Communication Technologies. These will be complemented by strengths in the Faculties of Science and Social Science, using expertise in Systems Engineering to integrate the wide range of environmental, technological, economic and behavioural factors involved in achieving sustainable development objectives.

Whilst BRITE remains at an embryonic stage, significant progress has already been made in mapping out our existing strengths and identifying new research opportunities. A ‘Setting The BRITE Agenda’ event, in November last year, assembled researchers from across the University to discuss opportunities for collaboration under BRITE’s six core themes. This was complemented by an evening seminar, with presentations from inspirational speakers including:

Rob Hopkins - Founder of the Transition Towns Movement;
Sue Roof - Professor of Architectural Engineering, Heriot Watt University;

Herbie Girardet - Director of Programmes, World Future Council.

The following day marked the Inaugural Meeting of BRITE’s External Advisory Board, consisting of prominent industrialists and academics from a range of backgrounds linked to sustainable development. Critical feedback was gained on proposed research initiatives and this was used to consolidate BRITE’s initial development priorities.

More recently was the 2009 Annual Garrad Hassan Renewable Energy Lecture on Energy Security and Complexity, delivered by Professor Catherine Mitchell from the University of Exeter early this year. In her presentation on ‘Energy Security and Complexity’ (available for download from www.bris.ac.uk/brite), Catherine outlined the key challenges facing the international community as it attempts to move from a heavy reliance on fossil fuels towards a more sustainable energy supply. The lecture was attended by around 200 people, demonstrating the high level of interest in this topic both within the University and local community. Such events, combined with additional efforts to publicise BRITE are clearly gaining success. More recently, George Osborne, Shadow Chancellor of the Exchequer, specifically chose the Faculty to announce a new green paper on environmental technologies because he had heard about BRITE’s development. This was followed just two weeks later by a visit from Glyn Ford, the South West Member of the European Parliament, and a delegation of North Korean politicians who also expressed a strong interest in our environmental technologies research. All were given an overview of work conducted by Professor Phil Mellor’s Energy Management Group and were shown a demonstrator model of the tidal stream device being developed by Tidal Generation Ltd (TGL), a company based in the University Gate SETsquared space.

New teaching initiatives are also set to play a key role in the future development of BRITE. These will be essential to address the predicted skills shortage in the environmental technology sector and even amidst the current economic downturn this is an area which continues to enjoy increased growth.
Unique Masters Level units in 'Engineering Design for Wind and Marine Power' and 'Sustainable Systems' have been successfully launched this year, both featuring strong input from external industrial lecturers. These complement existing Faculty courses such as 'Engineering for the Built Environment', 'Power Generation for the 22nd Century' and 'Energy Management', in addition to the multi-disciplinary 'Sustainable Development' unit, open to all university students.

Although momentum continues to grow, the future success of BRITE will depend on increased engagement with both academics and students across a range of disciplines. There are numerous ways to become involved, including developing research proposals, organising seminars, providing web-site input and helping to plan a major launch event scheduled for November 2009. Any help you feel you can provide in driving this initiative forward would be greatly appreciated and please e-mail brite-enquiries@bris.ac.uk with any ideas for BRITE’s development or to find out more about how to become involved.

Further information on BRITE and details of forthcoming events can be found at www.bris.ac.uk/brite

Paul Harper
In the last couple of years, the Faculty of Engineering, led by Aerospace Engineering and the Faculty Technical Support team, has been building a capability in rapid manufacture to support our numerous teaching and research activities.

To this end we have just procured a new industrial scale, high quality rapid manufacturing machine to supplement the existing smaller scale 3D printer which has been up and running for the past two years. In essence both machines work along similar principles, taking computer generated graphical images and building 3D components using a layer-by-layer deposition of plastic material, a process known as Fused Deposition Modelling (FDM).

The newly acquired machine provides a high quality, 3D manufacturing capability including the creation of moving parts/mechanisms via the laydown of a soluble component which is removable post-manufacture. It directly accepts standard image files (STL files typically created by CAD software packages) which require no special preparation and is ideally suited to a range of users from novice to expert. It is capable of building models up to 355 mm x 254 mm x 254 mm in a variety of thermoplastics (with a choice of colours) in layers as small as 0.127 mm thickness. It also offers a capability to build in a special high temperature plastic (polyphenylsulfone) which can withstand 200°C. FDM produces parts that are tough enough to be used for conceptual models, functional prototypes, manufacturing tools, and end-use parts. They can be sanded, painted, coated, sealed, bolted, and drilled. Although the aesthetics are different from an injection-molded part, accuracy and strength are comparable.

This new capability significantly enhances the student learning experience at both undergraduate and postgraduate level. For example, in the teaching of design and manufacture it allows the realisation of student design projects, demonstration of mechanisms, and understanding of manufacturability, across all Engineering disciplines. In research, the rapid creation of prototype components/models will save tremendous amounts of time and effort currently expended by both staff and students.

Opening up the service to collaborators in Arts, Science, Medical & Veterinary Sciences, and Medicine & Dentistry, should help facilitate the visualisation and realisation of intangible objects to aid knowledge and understanding – e.g. molecules, archaeological and palaeobiological artefacts, anatomical features, prosthetic devices etc. Furthermore, if coupled with images from techniques such as ultrasound/CT/MRI scanning, it should be possible to create replicas of hidden and in-vivo objects.

Thinking of our overall public engagement, admissions and outreach activities, we should also make significant use of this capability within Engineering to have a wholly positive impact on enhancing displays, summer school experiences (i.e. design it, build it!), help encourage SET careers (e.g. physical manifestation of intangible objects - dinosaur skulls to nanotubes), and generally augment open-house activities.

We are keen to see the use of this facility maximised and both machines are currently available for all to use.

For further information on this, or if you would like to know more about their capabilities or arrange a demonstration, please contact i.p.bond@bristol.ac.uk

Ian Bond
The UK in general, and the University of Bristol in particular, is a world leader in vision science. Bristol has a long and rich tradition at the forefront of the study of human and animal vision, artificial vision systems and imaging more generally. The University recently identified vision science as one of its core “research themes” and underlined this with the creation, in 2007, of the Bristol Vision Institute (BVI).

BVI currently functions as a virtual research institute and has been highly successful in stimulating research interaction and collaboration. It is built on the belief that interdisciplinary research is central to the future development of the field. BVI brings together engineers and scientists from a range of academic disciplines including electrical and electronic engineering, computer science, biological sciences, experimental psychology, mathematics, biochemistry, anatomy, together with external partners such as the Bristol Eye Hospital, UWE’s machine Vision Group and the Bristol Robotics Laboratory. There are also emerging links with the newly to-be-established, Wolfson-supported, Clinical Research and Imaging Centre, and the Wolfson Bioimaging Centre.

BVI currently represents a grouping of around 36 permanent academic staff and some 60 researchers at Bristol working on vision and imaging research and its engineering applications. BVI staff have published around 200 leading journal papers over the past five years and hold 23 editorial positions on international journals.

Since its inception, BVI has been the umbrella for many new research activities across all partner Departments. These include: the modelling of camouflage and its role in improving the detection of difficult targets in an image or video; low light live cell imaging; anatomical imaging, animal tracking and identification, the analysis of historical works of art; the study of how everyday motor behaviour is controlled by visual information; the understanding and modelling of how the central nervous system processes visual inputs; and the development of new image quality metrics.

BVI runs a seminar series with national and international speakers from Europe, Australia, Asia and the USA, and has organised a number of workshops and conferences (for example, it hosted the December meeting of the Applied Vision Association). It also regularly hosts international visitors, the next being Prof Sheila Hemami from Cornell University. A major one-day workshop is planned for June 2009. The institute also runs a unique post-graduate training programme in vision research, funded by the EPSRC.

Professor David Bull, Professor of Signal Processing in the Department of Electrical and Electronic Engineering and Director of BVI said “The scale of this collaboration is unique in Europe and has unequalled potential for progressing vision research in its broadest sense - from perception to application. BVI is now moving into its second phase. Due to unprecedented levels of interaction across academic disciplines as well as emerging external collaborations and joint postgraduate training commitments, there are now plans for shared facilities and space. We are also fortunate that, in 2008, Dr Jane Hallett was appointed as BVI Facilitator to help stimulate, co-ordinate and grow the Institute’s activities.”
The Royal Society MP-Scientist Pairing scheme is open to Royal Society and Research Council Research Fellows, and has the following aims:

- To help scientists recognise the potential methods and structures through which they can feed their scientific knowledge to parliamentarians and Government.
- To help practising research scientists understand the pressures under which MPs operate.
- To give MPs the opportunity to forge direct links with a network of practising research scientists.
- To give MPs the opportunity to familiarise themselves with the process of scientific understanding and topical research and ultimately to be able to bring this new knowledge into better informed discussions and decision making.

I was fortunate enough to be selected as one of 12 scientists and was paired with Stephen Williams MP (Lib Dem, Bristol West). First of all, I spent a week in Westminster where my time was split between shadowing Stephen and attending a series of parliamentary committee meetings, such as the Innovation, Universities, Science and Skills Select Committee. Following this, Stephen shadowed me within the Faculty where I showed him some of the latest research developments and introduced him to some healthy researcher–supervisor discussions. Finally, I spent time with Stephen in his constituency, where activities included opening the brand-new North Bristol NHS Trust Paediatrics Communications Aid Service (PCAS) at Clarendon School in Henleaze, the ceremony being conducted by HRH Princess Anne.

There were many highlights. Of high personal interest were select committee meetings concerning the provision of the necessary skills for a new generation of civil nuclear power stations and “cross examination” of the new Chief Scientific Adviser John Beddington. I was quietly pleased to observe that when attending a reception hosted by Western Aerospace companies I already knew quite a few people, including our own Mark Lowenberg. While attending a television interview I finally managed to gain access to the “Green Room,” which caused me to wonder why all television waiting rooms are called Green? For the first time I was exposed to the eye-opening world of public media. I gave two interviews to Research Fortnight magazine and contributed to an article on knowledge transfer between universities and industry, which appeared in The House Magazine.

So what did I learn? Thinking about research funding, I learned the importance of collaborating with all groups who share a common interest and who are tackling similar problems, and communicating and lobbying effectively as a group. Is the scheme worthwhile? Absolutely – it clarified the complex process by which research funding budgets are set. Also, on a less serious note, any scheme that provides unhindered access to the Palace of Westminster for a week is one worth doing. It is a truly remarkable place.

Chris Truman, Reader in Solid Mechanics with the Department of Mechanical Engineering gained some interesting experience when he took part in the Royal Society MP-Scientist Pairing Scheme recently.

The most widely accepted origin of the term ‘green room’ dates back to Shakespearean theatre. Actors would prepare for their performances in a room filled with plants and shrubs. It was believed that the moisture in the topiary was beneficial to the actors’ voices.
John Macdonald from the Department of Civil Engineering explores the problem of lateral ‘wobble’

On its opening day, the London Millennium Bridge experienced unexpected swaying due to crowd loading and as a result the bridge was temporarily closed. However, the problem was not unique to that bridge. Similar behaviour has been identified on numerous bridges of different structural forms, including the Clifton Suspension Bridge in Bristol, as measured by the Department of Civil Engineering. In fact it is now realised that the same problem could occur on virtually any bridge, if loaded with a large enough number of pedestrians.

This type of lateral ‘wobble’ is different in its direction and origin from the well understood vertical vibrations, for which it is well known that soldiers need to break step when crossing bridges. On the Millennium Bridge it was soon realised that the pedestrian dynamic loading was influenced by the motion of the bridge itself, giving some sort of feedback loop in the behaviour. It was generally thought that the mechanism involved pedestrians synchronising their footsteps with the bridge motion. However, this is not supported by more recent measurements on other bridges, including the Clifton Suspension Bridge.

A new study in the Department of Civil Engineering, published in the Proceedings of the Royal Society A, finally offers a fundamental explanation of this type of bridge ‘wobble’. The key is in considering the basic way humans maintain balance, drawing on findings from biomechanics research – the first time this has been done in the context of structural vibrations. Balance is achieved by changing the position, rather than the timing, of foot placement for each step. In normal walking, if the body motion is perturbed, by a gust of wind for example, the width of the next step is subconsciously adjusted to compensate and maintain balance. The same balance strategy as for normal walking on a stationary surface was applied to walking on a laterally swaying bridge. It was found that without altering their pacing frequency, averaged over a large number of cycles, each pedestrian can effectively feed energy into bridge oscillations, which may be at different frequency. The results concur with back calculations from measurements on the Millennium Bridge by the designers Arups (and similarly from the University’s measurements on the Clifton Suspension Bridge), but it has been shown that synchronisation of the pedestrians is not required.

Hence, surprisingly, pedestrians walking randomly, keeping balance as normal, can inadvertently cause bridge oscillations to build up to large amplitudes. This finally seems to explain the underlying mechanism of the Millennium Bridge ‘wobble’. It is hoped that generalisation of the findings will be used to design future bridges against similar vibration problems.
James Clarke is a postgraduate research associate of the Electrical Energy Management Group within the Electrical Engineering department.

James joined the Electrical Energy Management Group in order to study renewable energy systems and in addition to his PhD he is launching a social enterprise called Tikambilanie - ‘Sustainable Communication’. The UK launch will be in Bristol in May.

It is now widely acknowledged that for realistic sustainable solutions to social and environmental issues, a holistic approach that incorporates those involved at its centre is required. Public participation in planning, health and environmental problems has long been designated as important. There is, however, a tendency for such obligation to be considered as a hindrance. Also, these are often costly and time consuming exercises, so the overall aim must be to develop methods that use participation to ensure that projects are correctly targeted and that their impact is optimised.

Tikambilanie works on how we can empower individuals, communities, disciplines and sectors to enhance their own development through simple but grounded and comprehensive communication. The key idea is that communication should be a two-way and continuous process, rather than something whereby a static final goal can be achieved. From a UK perspective the launch will be hosted by the Zambian community arts for development group, Kamoto, and a Zambian environmentalist from The Green Living Movement. The contrast in culture and attitude forms the basis of the work.

Action Research and Participatory Performance Practices are well established methods for ensuring that target communities are engaged and mobilised. In developing countries, such approaches have been effectively used to ensure NGOs, governments and world organisations effectively deliver real beneficial change to the communities they attempt to help. Kamoto, and The Green Living Movement have been involved in such work for the past two decades.

Tikambilanie believes that in an increasingly complex society it is imperative that transparent communication channels exist across all kinds of communities. The current environmental situation offers a perfect example. Small changes in behaviour and mentality will be required if we are to approach a more sustainable future. Whilst it is often stated that people don’t like change, it is Tikambilanie’s view that actually people just don’t like to be told to change, so methods of communication are key to making progress.

Tikambilanie will be running a programme of entertaining events under the headings ‘Let’s Talk’, ‘Let’s Dance’ & ‘Let’s Jam’. These events will focus on Sustainable Development, Equality & Diversity and Community Capacity Building.

We wish to work alongside community & interest groups that exist in Bristol, bringing our expertise whilst also learning from others. If you would like to know more, visit www.tikambilanie.org

James Clarke

Kamoto the Zambian community arts for development group perform at the World Village Festival, Helsinki, 2008
From the Engineering Archives

“The Engineering Library in Queen’s Building provides for the needs of the five Departments in the Faculty. It contains about 11,410 volumes and 745 pamphlets, and 350 periodicals are currently received.”

The Faculty of Engineering prospectus 1960

In 1959 Geoffrey Spittal, the University Librarian-in-charge, described the new Queen’s Building Library in an article printed in The Library Association Record. What follows is an abridged version...

The present collection of engineering books grew from an amalgamation of the University College and the Merchant Venturers’ Technical College holdings in 1910; both institutions had previously profited in their early days by generous gifts from various publishers, notably from the University Presses at Oxford and Cambridge. Borrowing records for the MTVC extend back to 1891, and in 1894 the library contained 1,580 bound volumes.

On the 9th of October, 1906, the library escaped the effects of a disastrous fire on the Unity Street premises, it was moved from there in 1906 and again in 1955 when it opened in the Queen’s Building.

For reasons of quiet and seclusion the library was planned at a mezzanine level, as a southern annexe to the main building.

The ground floor of the library, giving accommodation for eighty readers and 15,000 volumes, occupies an area of 6,300 sq ft divided between eleven alcoves, with a central aisle, eleven feet wide and one hundred feet long. The ground floor is completely encircled by a gallery, twelve feet wide, with alcoves to seat fifty-two readers. Connected to both gallery and ground floor by a capacious lift is a stack-room intended to house a further 45,000 volumes. Here, beneath the windows, are twelve study-desks reserved for the use of staff, or postgraduate research students who may wish to pursue prolonged research projects free from the disturbances they must usually expect even in their own private rooms.

Provision for an ultimate total of more than 77,000 volumes may seem like the height of visionary far-sightedness in planning, but it should be borne in mind that this new library has to serve applied, natural and pure sciences in some of their most important and most rapidly developing aspects: moreover, a completely new building can theoretically be supposed to last for ever.

The number of volumes has since grown to 130,000!
Jane Hallet joined the University of Bristol in July 2008 as facilitator for two of the University’s research themes, Predictive Life Sciences and Bristol Vision. Although physically based in the School of Biological Sciences, she is frequently to be seen in both Queen’s Building and MVB, as both research themes have leadership and a strong core membership in the Faculty of Engineering.

Jane has taken the opportunity to develop cross-disciplinary interfaces between engineers and life scientists, physical scientists and mathematicians, though this is not without its challenges, especially finding a common language.

Her own academic background has spanned several disciplines, starting with undergraduate studies in physics and psychology and culminating in a doctorate in vision science. Prior to joining Bristol, Jane spent eight years at Cardiff University, firstly as a post-doc and then in research support for the RAE.

Outside work, with two young children to keep her busy, Jane also enjoys walking and pilates.

Theo Tryfonas joined the faculty in July 2008 as a Lecturer in Systems Engineering in the Department of Civil Engineering.

Originally from Greece, Theo has worked in the past as a programmer, consultant and auditor for Greek and UK companies, particularly in the industries of transportation, utilities, healthcare and government. He is a computer scientist by training with primary interests in security engineering and applications of computing in civil engineering systems, particularly wireless sensors. His current research activity is focused on sustainable systems engineering and aspects of learning in higher education. He also works with the Bristol-Bath EngD Centre in Systems where he teaches the Research Engineers and supervises a few of their doctoral projects.

Theo is married to Catherine and has a little daughter, Chrisa-Sophia. He enjoys football and is fascinated by church architectures.

Philippa Settle joined the Department of Electrical and Electronic Engineering in November to work for the next year as Departmental Administration Manager. Qualified as a Company Secretary, she has been working as a senior professional administrator since 1991 when she joined Groundwork in Otger as Finance and Administration Manager. Between 1996 and 2002 she worked for The Prince’s Trust where she planned and managed the change of administration staff structure in Wales when four independent Trusts amalgamated. Whilst in the Princes Trust she worked on national projects for health and safety and job evaluation as well as managing delivery of New Deal for young people starting in business and playing a key role in negotiating a major partnership millennium project with the main youth organisations working in communities across Wales and funded by the National Lottery. Over this period she also organised some high profile events including presentations attended by Prince Charles at St James’s Palace.

Joining Rhonddua Cynon Taf County Borough Council in 2002, she worked as Business Support Services Manager for Environmental Services over a period of structural change and the introduction of Key Performance Indicators to measure success and compare authorities. With all Environmental Services engaged in the business planning process, she took voluntary redundancy as part of a further structural shuffle following a change of administration. Since then she has worked on two maternity cover contracts in Cardiff University gaining experience in the sector as Administration Manager in the Law School and Administrator in a research institute. Professionally, she enjoys the University environment and hopes to move on to a permanent contract in Higher Education.

In her personal life she is married with three grown up children and two grandchildren and lives in Bridgend with her husband and a much pampered cat. Hobbies include playing scrabble, cooking for friends and family and playing the piano very badly as a late learner.

Luca Giuggioli is a Lecturer in Complexity Sciences for both the Department of Engineering Mathematics and School of Biological Sciences. A theoretical physicist by training, his research interests are on the application of statistical mechanics techniques to biology. Luca’s interest in answering biological questions emerged after his PhD when he conducted an interdisciplinary project on the ecology of the Hanta virus epidemic in New Mexico.

The desire to know more about biology prompted him to continue his postdoctoral studies in the Ecology and Evolutionary Biology department at Princeton University, which eventually brought him here to Bristol in the Engineering Mathematics department and the School of Biological Sciences.

Luca’s general scientific interest in ecology is the construction of spatially explicit theoretical models, validated through experimental observations, with the aim of explaining a variety of processes such as territoriality, foraging, disease spread and ecosystem nutrient cycling. Some of the features central to these apparently disparate processes is how animals, they being mammals or bacteria, move and interact among each other.

His objective is to study and ultimately predict how certain spatio-temporal ecological patterns emerge from basic “microscope” interactions and movement rules.

The Faculty is always pleased to welcome new members of staff. Here we feature a few of the latest arrivals.
What is your earliest memory?
Sitting with my mother and siblings on a train from Jaffna to Colombo, looking out of the window at the passing scene - beautiful waterfalls, paddy fields and children playing in the river. Feeling excited because we were about to spend our holiday with my mother’s family, but the train journey was also part of the fun. As a teacher, my mother was entitled to free train travel – the 200 mile journey would take 8 hours as the (express!) train stopped at every station. At every stop, people would get out of the train and buy drinks and snacks from sellers at the station.

What did you want to be when you were a child?
I always wanted to be a Professor (in Maths or Engineering) – they command enormous respect in Sri Lanka!

Where and when were you happiest?
Camping holidays in Cornwall are always fun. But what really stands out as a happy memory was snorkelling in the Great Barrier Reef last summer, seeing the beautiful corals and the thrill on my children’s faces as they spotted clown fish (made famous by the film “Finding Nemo”).

Describe yourself in four words?
Friendly, determined, dedicated and positive.

What are you most proud of?
Professionally, it’s probably the work I did for my PhD, in which I tried to find solutions to what is known as “cocktail party effect” or the inability to differentiate sound from background noise. I developed an algorithm to help alleviate the signal separation problem in hearing aids. In a social sense, it’s the time I spent as a volunteer in Brazil during the summer vacation when I was an undergraduate student. I helped to build a school and got involved in all the manual work. I’ll always remember the local people – so cheerful and positive and accepting of the people coming into their community.

If you could change one thing…?
I’d like to be taller!

What single item would you save if your house was on fire?
My laptop!

Favourite place in the world?
At the top of Mount Sinai at sunrise. (A three-hour climb in 1990, setting off at dusk, and spending a few hours shivering at the top without a blanket, was all made worthwhile by the spectacular sunrise.) I also like Kuala Lumpur, for its liveliness, its blend of East and West, and its delicious food.

Where would you rather be now?
I’m happy to be here in Bristol.

What makes you smile?
My children. (Nishan is married to Thabitha and has a daughter, Aarabi, and two sons, Sujan and Dheeran.)

What worries you?
What kind of life my children will have. The usual worries that all parents have.

How would you like to be remembered?
Hopefully as someone who lived life to the full, while doing something useful in the process.

If money were no object I’d…
Money is not that important to me. I’m not interested in having a bigger house or more possessions. What I would like though is to see more of my brothers and their families – they live in the US and so I can’t see as much of them as I would like. So perhaps I’d pay for all my family members to come and live in Bristol (if they want to!)
Computer Science - the first 25 years

Computer Science kicked off their 25th anniversary celebrations this year with a party for students, staff and alumni. The atria of the Merchant Venturers Building (home of the Computer Science department) were transformed with lights and decorations as well as a bar and casino installed especially for the occasion.

The Department is well known for its informal and friendly atmosphere but members of the department made a special effort to look the part for this glamorous occasion. DJs were dusted down and shoes polished as over 170 guests came to drink champagne, listen to jazz, play roulette and black jack at the casino before dancing the night away.

Nishan Canagarajah, Head of Department said, "I had never imagined you could see so many ‘smartly dressed’ computer scientists having such a good time. The decorations and the atmosphere in the atria were simply fabulous. My thanks go to everyone who worked so hard to make the evening such a memorable one."

As part of the 25th anniversary celebrations there will be a series of events and lectures happening throughout 2009.

During Convocation Weekend, on Friday 3rd July, Computer Science staff and alumni have been invited to a drinks reception, meal and live music in the beautiful setting of Goldney Hall overlooking the Cumberland Basin, Clifton Suspension Bridge and the Avon Gorge.

In honour of the very first Head of Department, Computer Science is launching the Mike Rogers Scholarships which will provide ten scholarships for home/EU students worth up to two thousand pounds each over the course of the degree.

There will also be a series of talks and lectures throughout the year, the first of which, ‘Is Privacy Possible in the 21st Century’, was held at the Watershed on February 12th.

News and up to date information on all our plans for the year can be found at: http://www.cs.bris.ac.uk/25/