



University of  
BRISTOL

2009  
CENTENARY

# LynchPin

Bristol Engineering



Summer 2009

⊕ Centenary  
issue - the  
Faculty  
celebrates  
100 years



■ **LynchPin Summer 2009**

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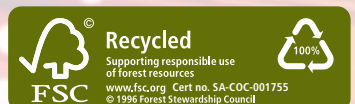
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Please Recycle



# welcome

As both Faculty and University celebrate their centenaries, it seems a good moment to reflect on a big question that I am frequently asked: what is the role of a University? As an Engineer I take a pragmatic and simple approach: universities educate the next generation of leaders, and we do fundamental research that will be of long-term benefit to us all. The first point is the most significant. In Engineering, education underpins everything we do: it is the lifeblood of the Faculty and is the major reason why all staff enjoy working in a University. Students' fresh perspectives and thinking are the driving force behind many of the good things that come out of the Faculty. The announcement of the Royal Academy of Engineering Leadership Awards has been inspirational: five of our students won awards out of 29 nationally. This is an astonishing achievement: my congratulations go to Graham Hinchly, Peter Levi, Edward Thompson, Richard van Arkel and Tom Mynors. Clearly our students have the potential to be leaders in their chosen fields. This, more than anything else, distinguishes Bristol Engineering: it is not the ability of our students to solve second-order differential equations alone which will make them shine,

but it is their ability to inspire and lead new initiatives. Good luck to all of you in your future careers.

In research, recent announcements of major grants provide evidence that we are carrying out research at the leading edge of engineering. In Computer Science, the awards in Computational Biology shows that engineers can work across boundaries in an entirely new and innovative area: ten years ago, I certainly would not have anticipated this research emerging from the Faculty. The recent announcement of an EU grant in Earthquake Engineering shows that we continue to lead the world in one of our core discipline areas. The nature of research means that the outcome is often unexpected, leading us into new and surprising areas. This is exactly what the very best research should do; if the outcome were predictable then it would simply be development. I am always surprised that an even greater proportion of our graduates do not go into research – it is genuinely stimulating.

Summer is here - traditionally the season when we have the time and opportunity



DAVE PRATT

to cultivate new ideas for research and teaching. This means that, contrary to popular belief, it is one of the busiest times of the year: it's when the renewal of ideas can lead to greater things. With the Centenary giving us much food for thought as we look back at an inspiring past, let us hope that this summer is a particularly fruitful one as we look forward to the future.

Professor Nick Lieven  
Dean of Engineering

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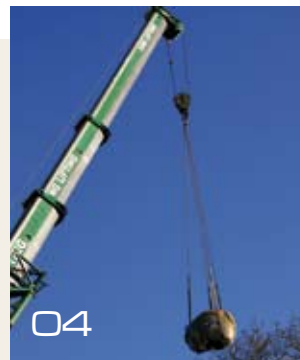
The Faculty staff and students gather together for their first formal photograph

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# The latest news and events from around the Faculty

**Timo Kunkel's winning design in the University's centenary banner competition**

**Professor John Hogan**

**Mr Timo Kunkel**

**Dr Andrew Harrison**

**Dr Ashley Montanaro**

## **New Research Director appointed**

The Faculty has appointed Professor John Hogan as the new Research Director, he takes over the role from Professor Nishan Canagarajah. John is currently Professor of Mathematics in the department of Engineering Mathematics.

## **Centenary competition success**

Timo Kunkel, a research student in the Department of Computer Science, has been chosen as the winner of the University's centenary banner competition.

His photograph, showing the Wills Memorial Building, Park Street, the Triangle and surrounding area, is displayed on a banner 15 metres wide by 6 metres sited on the west wall of the Physics Building (facing Royal Fort Lodge).

Speaking about his inspiration for the photo, Timo said: "The idea behind the photograph was to create a small 'planet' that is illuminated by the sun from on one side while the other side is at night. Due to the unusual projection, the interaction of light sources and shadows creates an interesting ambience. It also shows the continuation of changes of night and day and therefore represents time."

The photograph is assembled out of two spherical panoramas captured with a Canon EOS 40D, one for the day image, one for the night. The source images have been geometry corrected with DxO, assembled with Autodesk Stitcher, post processed with Adobe Photoshop and converted from an equirectangular to a polar and then to a hyperbolic projection using Flaming Pear Flexify. Further examples of Timo's work can be found in the atrium and corridors of the Merchant Venturers Building.

Timo wins for himself and a guest the prize of a free flight in the University of Bristol balloon, courtesy of BUHABS, the University's balloon society.

## **A Marathon achievement**

Andrew Harrison, Senior Lecturer in the Mechanical Engineering department, took part in the 2009 London Marathon, finishing in 2 hours 37 minutes and 15 seconds. This was his quickest time for this distance, and placed him 145th out of 34,000 runners. On being asked "how do you feel?" by a

journalist, he replied "tired". The intense banality of this exchange gives him particular pride: "I couldn't have done it without the journo's help" he said later.

## **EPSRC Fellowship Award**

Dr Ashley Montanaro, a postdoctoral researcher in the Department of Computer Science, has been awarded a Postdoctoral Fellowship in Theoretical Computer Science by the UK Engineering and Physical Sciences Research Council. These prestigious awards are intended to enable the most talented new researchers to establish an independent research career, shortly or immediately after completing a PhD.

Ashley's research aims to find new algorithms for quantum computers, which are machines that take advantage of quantum mechanics to achieve dramatic speedups over any possible standard computer based only on classical physics.

## **Kyoto Workshop**

On the 23rd April the universities of Bristol and Kyoto held a research Workshop in ICT in Bristol to promote research collaboration between the two organisations. This Workshop was the first step in developing and strengthening the Memorandum of Understanding signed in 2008. Topics discussed at the Workshop included Wireless Communications, Creative Media and Technology Transfer. The event was opened by the Vice Chancellor of Bristol University, Professor Eric Thomas, and Professor Keisuke Makino, Vice President, Director-General of the University Office of Society-Academia Collaboration for Innovation at Kyoto University with the keynote address being given by Professor Joe McGeehan of the Department of Electrical and Electronic Engineering. Participants at the Workshop included researchers from both universities, and invited industrialists from both the UK and Japan. It is intended to organise student and staff exchanges, and to establish joint research projects as a mechanism for further research collaboration.

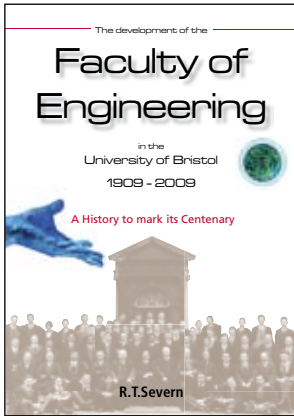
## **2nd Annual ACCIS Conference and Composites for Energy Seminar**

The 2nd Annual ACCIS (Advanced Composites Centre for Innovation and Science) Conference will be held on Tuesday 30th June, featuring a range of presentations on the group's current activities, including



details of the new Composites Doctoral Training Centre. The event will also incorporate a more focused 'Composites for Energy' seminar, organised in conjunction with BRITE. This will examine a selection of composites research challenges within the renewable energy industry and how these are being addressed by specific projects within ACCIS. Examples will be drawn from the wind, marine and solar power sectors.

For further information and to reserve a place, please contact Sarah Wordsworth (Sarah.Wordsworth@bris.ac.uk).



## Announcements

LynchPin is sorry to announce the death of Mr Peter Threlfall who died recently, on 27 February 2009, aged 82. Peter Threlfall joined the Faculty as a Lecturer in 1956 in the Department of Mechanical Engineering and retired in July 1984.

Some of you may also remember Professor Tom Lawson, who was in the Department of Aerospace Engineering until 2001. Sadly, we have just heard that he passed away in March. He is survived by his wife, Pauline (they had been married for over 60 years), six children and numerous grandchildren.

## Diary dates

The dates of the Graduation Ceremonies have been confirmed as follows:

### FRIDAY 10 JULY - MORNING CEREMONY (11.15 am)

BEng, BSc, MEng and related postgraduate degrees in  
 Civil Engineering  
 Computer Science  
 Computer Systems Engineering  
 Electrical and Electronic Engineering  
 Engineering Design  
 Engineering Mathematics  
 Mechanical Engineering

### FRIDAY 10 JULY - AFTERNOON CEREMONY (2.30 pm)

BEng, MEng and related postgraduate degrees in  
 Aeronautical Engineering  
 Avionic Systems

### Professor Severn's History of the Faculty

#### Professor Tom Lawson

#### Delegates at the Kyoto Workshop in Bristol

#### The operation to relocate the 'Brunel Boulders' to their new home on Cantocks Close

## 'The Development of the Faculty of Engineering 1909-2009 - a History to mark its Centenary'

This definitive book about the Faculty has now been published and is available from the Alumni Relations Office, Senate House, Woodland Road, University of Bristol. It is priced at £50, with proceeds going to the Centenary Fund 'ring-fenced' for financial support to Engineering students. The book charts the development of the Faculty over the last 100 years and is written by Emeritus Professor Roy Severn who joined the University as Lecturer in Civil Engineering in 1956. An interview with Professor Severn appears on page 12 of this issue of LynchPin.

## The Brunel Boulders are reunited in Cantocks Close

A five-ton nodule of sandstone, one of a pair excavated by Isambard Kingdom Brunel, has been reunited with its even heavier twin on the University precinct after 21 years apart. The two nodules of sandstone, dating from the Late Carboniferous period over 300 million years ago, were unearthed in 1837 during the excavation of the Great Western Railway Tunnel near St Anne's, Bristol. Brunel was so taken with them that he had them mounted at the side of the railway. When St Anne's Park station closed in 1970, the stones remained on the disused platform until Sir Alfred Pugsley, then Emeritus Professor of Engineering, secured one of them for the University. It was transported to a patch of lawn on Woodland Road under the supervision of Emeritus Professor Roy Severn in Civil Engineering.

Thanks to the efforts of Bob Hughes, a former member of staff at the University's Long Ashton Research Station, discussions with Network Rail have led to the arrival of the second stone. The pair have now been installed on the raised bed at the entrance to Cantock's Close and new signs will be erected to explain these remarkable geological features.

## Green Impact Award Scheme

The Department of Electrical and Electronic Engineering was awarded a Bronze Award for efforts made to improve their environmental performance. Forty-six departments took part in the University led Green Impact Award Scheme which aims to empower individuals and departments to reduce their environmental impact by encouraging, rewarding and celebrating practical environmental improvements.

Led by an enthusiastic team of volunteers, changes were implemented across the Department to help reduce its environmental impact. Throughout the short time that the Department has been taking part in this initiative, awareness has been raised significantly regarding energy usage and recycling.

The Department of Aerospace Engineering also went through a similar process and won a Bronze Award.

Full information on the Green Impact Award Scheme can be found at: [http://www.bristol.ac.uk/environment/green\\_impact/](http://www.bristol.ac.uk/environment/green_impact/)

# Engineers Without Borders

*As they near the end of their sixth year as a branch, Ben Kyriakou of EWB Bristol takes a look back on the events of the past year*

Students take part in practical science activities at Cape Town's Centre for Science and Technology (COSAT)

The Outreach Solar car project



Events are winding down now as exams approach, but there are some activities that even exam stress cannot stop - recently the EWB Bursaries panel met along with our Professional Network representatives to assess seven bursary applications from various applicants. Although all applications were strong, ranging from project management in South Africa to widespread sanitation research in Brazil, the £1000 we were allocated was split between four worthy projects to help with flights and other important costs.

Last term saw the launch of placements and research projects. Bristol had their own new placement to promote - Etienne Coetzee and Keith Bohannon of Airbus have participated with us to develop their link with Cape Town's Centre for Science and Technology (COSAT), a remarkable school for disadvantaged orphans that maintains a 100% A-level pass rate (the average at

other schools is 1%). With a high level of interest, the next step is to secure more funding for the placement - look out for this one next year!

Research projects also generated interest among students, and we will be working with both the Faculty and students to improve the selection for next year. If you have an idea for a research project that you would like to see tackled, then please get in contact and we can work with you to develop it into a feasible project.

Outreach has once again had a successful year - running projects in two local schools with another to come, and successfully launching the Solar Car project developed by our very own Bristol team. The response from member volunteers and the schools involved has been overwhelming, and if anyone would like to be involved in the future don't hesitate to get in touch. The experience of working with young students is invaluable, and there's even a free lunch thrown in!

The end of the year also sees changes - along with graduates there are many members who will be leaving us to study abroad for their third year. We wish them all the best of luck in their activities, whatever they may be, and hope that we can find

more students with the same drive and inspiration to take up the load.

A big thanks is due to the committee for all their hard work over the past two terms, with much more to come after the summer break!

Looking forward to next term, we will have the privilege of hosting the EWB-UK National Conference in honour of the University's Centenary. This promises to be an amazing event, with students, academics and professionals from both Bristol and our 18 UK branches involved. We hope that this will further stimulate our branch and provide an unforgettable experience for our members. Alongside this will be talks, training events and much more, so keep an eye out.

In closing, we would like to thank both the Faculty of Engineering for their ongoing support, and our wonderful members. If you're interested in sustainability and development then come along to an event or committee meeting next year, and see what EWB can do for you!

If you would like to get in touch or subscribe to our mailing list, please send an e-mail to [bristol@ewb-uk.org](mailto:bristol@ewb-uk.org) or visit [www.ewb-uk.org/bristol](http://www.ewb-uk.org/bristol)



# Ice cold

# in Minnesota

Chris and the CIV01 helicopter during icing trials in Minnesota

**Chris Hannon decided to take a year in industry because he believed it would increase his job prospects on graduation and was delighted to be offered an internship with AgustaWestland during his third year helicopter design project.**

The year at AgustaWestland was to be split into quarterly placements. The first was in Fuselage Aerodynamics and Environmental, where I worked on the behaviour of rotor blades in icing conditions.

Shortly after starting I heard about an icing flight trial planned to run during my third placement. Being opportunistic, I asked if I could go, and once I had been given the go ahead spent nearly three months in Minnesota, helping to qualify new main and tail rotors in icing conditions. This involved a Chinook flying in front of the AW101 test helicopter, known as "CIV01". The Chinook created an artificial icing cloud by spraying water; an advantage of this over flying

in a natural cloud is that a more water rich environment can be created, thereby vigorously testing the blades.

Before I went to Minnesota I spent three months working in Apache Engineering, during which time I learned to drive, which was my contribution to Yeovil's economy. Whilst there I submitted an abstract to present a paper at a Royal Aeronautical Society conference which was accepted. I researched the paper whilst in Apache Engineering; however, by January I was on the flight trial and my paper's progress was halted until I got back to England.

In Minnesota, I was slightly gobsmacked by the environment. The lowest temperature which I encountered was a bone chilling, nasal hair freezing  $-27^{\circ}\text{C}$ , so I spent my company clothing allowance wisely. A perk was getting to fly in the Chinook, standing on the oscillating ramp and photographing the CIV01 blades beating angrily 120 ft away. This nippy position was marvellous fun and I got 17 flights in the Chinook, in addition to flights in the chase aircraft.

During the trial I took a short holiday and flew to Florida to watch one of the last

Space Shuttle launches. My girlfriend joined me there so I could bore her with space jargon; it was Valentine's Day, so I had to make an effort! Much to my chagrin the launch was delayed, so I waddled - the American diet was taking its toll by this time - around the amusement parks before my return to Minnesota and the trial for more flying in the Chinook. Eventually I returned to England for tea and medals and continued writing my conference paper for presentation in June.

I am now working on the air conditioning for President Obama's helicopter and once I leave AgustaWestland I will prepare for my final year at Bristol.

Forgetting course content is a downside to a year in industry (another is your course mates have graduated once you start back), but I'm glad this did not deter me, as I now have experience which will help get me my graduate job.

Chris Hannon  
Aeronautical Engineering (MEng)

# Student awards

*Once again this term our students have taken the lead gaining many of the most prestigious awards on offer*



## The Aerospace Conceptual Design Award for Academic Year 2008-09

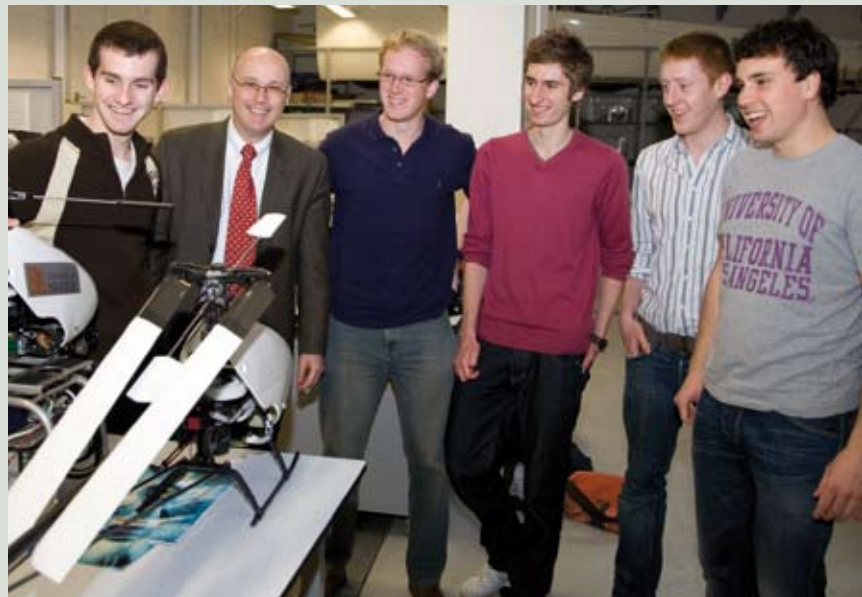
This award is bestowed to the best undergraduate selected from those who participated in the Department of Aerospace Engineering's capstone aircraft design project for a given academic year.

The aircraft design project undertaken by undergraduates at the University of Bristol is held in high regard owing to the close co-operation and support given by Airbus UK. Although academic merit is an important consideration, the award winner must have also demonstrated excellent technical specialist and multi-disciplinary skills, understood the importance of customer oriented thinking, been adept at social arbitration and conflict management, and, performed actions compatible with sound commercially viable technical decision making.

The winning student from the Team Viridis design group, Mr Salman Iqbal, was presented with a trophy, a certificate of recognition as well as a cheque for £50 by Professor Robin Brown (Airbus UK) and Dr Askin T. Isikveren (Unit Director) in a ceremony on Thursday, 14 May 2009.

Winner Salman Iqbal with Professor Robin Brown (Airbus UK) and Dr Askin T Isikveren (Unit Director)

The Dean congratulates our five winners. 1 to 5: Edward Thompson, Professor Nick Lieven, Tom Mynors, Graham Hinchly, Richard van Arkel, Peter Levi



## The Engineering Leadership Advanced Awards

**In 2008 we were proud to report four Bristol engineers winning the prestigious Engineering Leadership Advanced Awards from the Royal Academy of Engineering; the class of 2009 has gone one better, and five students have won awards.**

This means that Bristol was, jointly, the University with the most awards in the competition. The 2009 winners are: Graham Hinchly (Mechanical), Peter Levi, and Tom Mynors (Civil), Edward Thompson (Aeronautical), and Richard van Arkel (Engineering Maths).

Professor Nick Lieven said: 'I'm delighted by the continued and increasing success of Bristol engineers in these important awards - this group has represented the Faculty with great credit, and I'm very proud of them. Their plans for spending their awards sound ambitious and impressive - I will be cheering them on enthusiastically!'

The awards fund engineering undergraduates who wish to become engineering leaders to embark on an enhanced personal development programme. To achieve this, the winners receive £5,000 to implement their plan, which they devise in collaboration with the Royal Academy of Engineering. A selection event was held at the University of Warwick from 27 - 28 March, to which 56 of the original 150 applicants were invited.

Candidates were required to participate in a challenging range of selection activities that included presentations and interviews by Fellows of The Royal Academy and Sainsbury Management Fellows; 29 awards in total were made.

This year's award winners have a diverse range of plans. Peter Levi plans to put the award towards enhancing his study abroad year in California, and intends to learn Spanish. Graham Hinchly is also focussing on language skills: he plans to improve his French and begin to study Mandarin, as well as pursuing 'several courses to increase my knowledge of business outside engineering, for example sales and marketing'. Edward Thompson is 'likely to be going to Russia in the summer of 2010 to learn Russian and to gain work experience' and plans to do some disaster relief training with RedR. He hopes to fund some work experience in Spain, during his year abroad. Richard Van Arkel says he intends 'to use the award to learn French intensively in France and/or German in Germany. I also am currently weighing up a number of training courses in areas such as management, presentations and report writing'. Tom Mynors plans to go to Europe to examine their approach to transport via a work placement and site visits, and he will learn a European language.

■ LynchPin looks forward to hearing more from our winners in future issues.





# The AVDASI 3F/4F Design Project

**In the third year of a student's degree in Aerospace Engineering at Bristol, most undertake the Herculean task of the AVDASI 3F/4F design project. The third year students also team up with final year Rolls-Royce Industrial Master students.**

The module consists of 30 credit points – a quarter of the marks awarded in that academic year, and spans from Week 1 in October to the submission of the Final Engineering Definition Report (FEDR) in the first week of March.

In the last two years, students on the design project have been given the option of being on a fixed wing or rotary wing design team. This year, the fixed wing project is once again sponsored and part-assessed by Airbus UK, who conceived the Requirement Specification after a consultation with Greener By Design, a research group commissioned by the Royal Aeronautical Society who consult on all environmental issues facing the aviation industry today. The task was to design a commercial passenger airliner that could cover the world's long-haul routes (London to Singapore was the "study mission"), whilst optimising fuel-saving by flying those routes on "multi-stop" operations in order to promote fuel saving, and hence reduce both the impact on the earth's environment as well as the operating costs to the aircraft user. This year sees four teams from UoB as well as two from UWE competing to find the best possible design for this requirement.

The helicopter design project, sponsored by AgustaWestland Helicopters, has this year received more interest from Bristol students than ever before; there are two teams of students, called ATLAS and Bison, tasked with producing a design for a heavy-lift helicopter optimised for both search and rescue missions and relief aid in disaster areas. It appears that the students who chose the rotary wing project have an unparalleled passion for helicopters - the designs seen at the preliminary review had clearly had an immense amount of time and effort devoted to them. The competitive element between the helicopter teams is a little more fierce, though: with only two teams, you'll either come first or you'll come last!

The six fixed wing teams were Navitas, Viridis, Aether, Aquila, (University of Bristol), Green Hopper and Adastra, (UWE) mostly named with an apparently classical theme. I was a member of team Viridis (aptly named after the Latin word for green). Each member of a 12-person team would adopt a specialisation (Structures & Materials, Performance,

Stability & Control, Systems Architecture, Economics etc.) and elect a team leader. My job was to oversee the propulsion, noise and emissions part of the Viridis design.

The assessment of the work that a team completes is governed by the unit director, Dr Askin Isikveren. Dozens of representatives in industry also partake in the assessment process, in the form of two design reviews, the Preliminary Design Review (PDR) and the Final Design Review (FDR), in December and February respectively. Both of these reviews were formal events (every student wearing their best suit), with the FDRs taking place at Airbus Filton and AgustaWestland.

The involvement of industry representatives illustrates perfectly just how well-connected the Faculty of Engineering is within the world of Aerospace. Aside from the excellent and long-lived working relationship that the Faculty has with Airbus and AgustaWestland, there were guests invited to both review sessions from BAE Systems, Rolls Royce, GE Aviation and Qinetiq. It was immediately noticeable at the FDR how fortunate students are to discuss in-depth design concepts with engineers who have so much experience.

The AVDASI 3F/4F design project, I believe, is as close to the "real thing" as possible. The Department of Aerospace Engineering offers here an accurate simulation of what an actual aircraft design programme would entail. Certainly, many undergraduates who've undertaken this project will no doubt look back at their 3rd or 4th year at Bristol when they are involved in the production of a real air vehicle. The steps, techniques, computer models and quantitative methods that many of the AVDASI teams employ are identical to those used in industry today. Additionally, aside from the engineering knowledge this unit provides, each student that takes part in this project will walk away from it with better experience of working in a team, expertise in handling large amounts of data relevant to a complex system, public speaking and management skills.

It would seem that some AVDASI participants in the fixed wing groups are working somewhat beyond the call of duty this year. Dr Isikveren strongly recommended entering each team into the Merlin Flight Simulation Group Aircraft Design and Handling Competition, which takes place in June at the Royal Aeronautical Society in London, and is judged by a former RAF test pilot. The groups have risen to the challenge, and now frequently the aerospace department at the University of the West of England (UWE) to make use of their flight simulator, which offers the facility to tune an aircraft by varying several aerodynamic parameters.

This year's winning team at the FDR, Viridis, meanwhile, have sent a team representative, Ollie Steele, to Canada to represent the University of Bristol at the Canadian Aeronautics and Space Institute Aeronautics Conference in Ontario. Much to the envy of the rest of his team, he presented a technical paper prepared from the FEDR, entitled 'Advantages and Limitations of Multi-Stop Operations'.

The AVDASI design unit is one to be proud of. It is held in high regard by some of the world leaders in engineering projects, and trains the elite in the future of engineering design.

Fergus Atkinson-O'Sullivan  
3rd Year Aeronautical Engineering (MEng)



**The Aerospace Vehicle Architecture and Design**  
Integration teaching and research theme logo

**The winning designs in the fixed wing competition: Navitas, Viridis, Aether and Aquila**

# The Faculty



1909 The Society of Merchant Venturers agrees that the University Faculty of Engineering could be housed in its Unity Street buildings and supported financially by them



1916 The Bristol 'Sandwich' scheme for Engineers provides actual workshop experience in 23 important engineering firms



1924 Andrew Robertson is appointed Dean of the Faculty



1928 John Morrison is Head of Mechanical Engineering



1933 Former Engineering graduate Paul Dirac wins the Nobel Prize in Quantum Mechanics

*Bristol*



1946 Roderick Collar appointed  
The Aeronautical Engineering Department is created with a grant of £60,000 from the Bristol Aeroplane Company



1951 Winston Churchill lays the foundation stone for Queen's Building



1955 Faculty moves from its premises in Unity Street

1909

1917 Weekend classes for miners started

1919

1928 Alfred Pippard and John Baker join the Department of Civil Engineering

1929

1935 William Shepherd joins the Faculty

1939

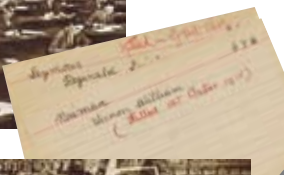
1945 Alfred Pugsley appointed

1949

1949 The Society of Merchant Venturers sold the Unity Street building to the City of Bristol, which in turn agrees to continue housing the Faculty there until their new building is completed

1958 Her Majesty the Queen formally opens the Queen's Building

1959



**As both the Faculty and the University celebrate their Centenary, LynchPin looks back on 100 years of Engineering at Bristol - from Unity Street to BRITE Futures..**

Education for engineering began in Bristol in the early eighteenth century under the sponsorship of the Society of Merchant Venturers in its Technical College - the MVTC - which towards the end of that century was located in Unity Street, at the lower end of Park Street. In 1876 University College Bristol (UCB) was founded, with a Department of Civil and Mechanical Engineering within its Science Faculty. Responding to both local and national pressure for the creation of 'civic' universities at the turn of the century, the two bodies began discussions on a merger, within what was eventually to become the University of Bristol. But a range of difficulties - personal, financial, and political - delayed the actual agreement until 1909. One issue causing the delay was the role and status of Engineering in the new university, MVTC

being much the stronger partner at that time. The Faculty of Engineering within the University of Bristol - but still housed in the MVTC building in Unity Street - continued to be largely concerned with its teaching role until new staff could be recruited after the 1914-18 war, notably Andrew Robertson as Professor of Mechanical Engineering. In 1924 he became the second permanent Dean until he retired in 1950. During this period Robertson recruited seven Professors whose reputations were to give the Faculty an international significance. These were, in the order in which they arrived in the University: Alfred J. Sutton-Pippard, John F. Baker, John L.M. Morrison, William M. Shepherd, Gordon H. Rawcliffe, Alfred G. Pugsley and A. Roderick Collar. Five of them became Fellows of the Royal Society, four were Founder Members of the Fellowship of Engineering, and five became Presidents of their Professional Institutions. Robertson himself was a Fellow of the Royal Society and President of the Institution of Mechanical Engineers, and, as Dean and also one of its members, he was able to persuade the UGC

to provide a new home for the Faculty in Queen's Building, finally occupied in 1955.

In 1946 the Department of Aeronautical Engineering was created through a large endowment from the Bristol Aeroplane Company. During the next 40 years - a period of continuous growth stimulated by the Robbins Report - the two major developments were greater Government involvement in university affairs, and the accession to the European Community (EC). The first of these saw pressure for an expansion of student numbers, with emphasis on science and engineering, but without the provision of the necessary resources. This disparity grew to crisis point in 1981 when cutbacks were enforced, requiring the University to close the Department of Architecture. The increasing Government overseeing of teaching practices and formal assessments of research output were also features of this period, and they enabled the Faculty to show during the ensuing 30 years that both its teaching and research were at the highest level.

# celebrates 100 years



1960 Students protest in support of the Anderson report, which called for higher student grants



1968 Roderick Collar appointed acting Vice Chancellor



1972 The Department of Engineering Mathematics formed under Ronald Milne



1981 Cutbacks forced the closure of the Department of Architecture which the Faculty had been largely responsible for creating in 1965



1985 Following on from the Finniston Report in 1979 the first 4 year MEng degrees are introduced

1995 The Merchant Venturers Building is opened by HRH the Duke of Edinburgh



2005 Bristol Laboratories for Advanced Dynamics Engineering are opened by Her Majesty the Queen



2009 The Faculty celebrates its centenary and moves forward with the launch of EF21 - Engineering for the 21st century

1963 The Robbins Report was commissioned by the British government to look into the future of higher education in the UK. The report recommended immediate expansion of universities



1968 In solidarity with their fellow students in Paris, Bristol students call for a 'Free University' that will offer higher education for all, regardless of age, religion, sex, academic achievement or financial background. Events escalate and lead to a sit-in at the Students' Union and an 11-day occupation of Senate House

1969



1979

1980 Ken Sander and Erik Dagless appointed to chairs to develop electronics and microelectronics

1989

1985 Computer Science formally left the Science Faculty and joined the Engineering Faculty. The department moved from the Mathematics building into Queen's building



1997 The Dearing Report (a series of major reports into the future of Higher Education in the UK) published. It recommended, amongst other things, that student loans replace government grants

1999

2007 The Advanced Composites Centre for Innovation and Science (ACCIS) is formally opened by the Minister of State for Science and Innovation, Malcolm Wicks

2009



The second development - joining the EC - was of significant benefit to all aspects of the Faculty's activities. In teaching, to achieve parity with European engineering education it was necessary to introduce 4-year MEng degrees, and through EC initiatives it became possible for students to spend one year of their studies in another European university. One consequence of this was the need to 'modularise' courses so that attempts at 'equivalence' could be made. The associated effect, of having European students in Bristol, was of benefit to students in all faculties of the University. In research, the Faculty succeeded in obtaining major EC-funded contracts, very often as coordinator of multi-partner teams, an activity which helped to establish the University at European level.

All this development resulted in a University investment to provide additional accommodation - the Merchant Venturers Building in Woodland Road - causing the Faculty to be split for the first time into what may be called 'heavy' and 'light' engineering.

Sir Ron Dearing's recommendations were implemented from 1997 onwards by the New Labour Government, and the Faculty benefited through success in a competition for new research infrastructure which was initiated by one of Dearing's proposals. This success resulted in 2005 in a £20million restructuring of Queen's Building to provide new laboratories. Other Dearing influences, of e-learning, widening participation, and tuition-fees to be paid by students, though of University-wide significance, were also major issues for the Faculty.

**The current Dean writes:** Teaching has and always will be at the core of the Engineering Faculty's raison d'être. It is interesting to note that the expectations on our graduating students by 21st Century employers are far more varied and changeable than we have seen for any previous generation of engineers. We can now reasonably expect our graduates to change role or indeed career every seven years throughout their working lives.

One of the major challenges we face in our education, then, is to provide fundamental knowledge of existing disciplines in a challenging environment that enables our students to adapt readily to changes which either they select or are forced upon them. This is not an easy task for educators or students!

In research perhaps our major challenge is the ongoing revolution of computing: we see computing becoming more embedded in all aspects of human life, from business and industry, to individual and collective communication. What is startling is the rate of change of these technologies and the unanticipated socio-economic consequences. It is vital that engineers are seen as the prime movers in these changes and not just passive providers of the technology. The need for engineers to work across the discipline boundaries is now greater than ever - the BRITE Futures Institute is a great example of this - but this is a challenge I know we are all relishing.

Photos in our timeline from the University Special Collections; Martin Chainey; Timo Kunkel; Andy Stevens

# Reflections and changes

The Structures  
Laboratories in  
Queen's building  
circa 1960



UNIVERSITY SPECIAL COLLECTIONS

## Roy Severn and John Bracey reflect on the changes they have seen during their many years in the Faculty

**There can be few people more qualified than Professor Roy Severn to reflect on the long-term changes that have happened in the Faculty of Engineering.**

Roy Severn was appointed as lecturer in Civil Engineering in 1956, became Professor in 1968, was Dean of Engineering (twice) and Pro-Vice-Chancellor of the University - these were posts he held alongside a distinguished research career. Now a Senior Research Fellow, he can still be seen around the Queen's Building, most recently as he finalised his book on the history of the Faculty, which has just been published.

Summarising how the Faculty has changed in the 50 years since he arrived, Professor Severn says 'it was much more formal in the past - in the 1950s students and staff wore jackets and ties - lectures were more formal still, with everyone wearing the appropriate academic gown; certain professors were known to dismiss students from lectures who were not dressed properly! For laboratory work, the dress code was necessarily less rigid, but there was a touch of formality in the colour-coded laboratory coats for the different departments'. He recalls one incident, soon after he was appointed Professor, in 1968: 'I chanced to meet Professor Roderick Collar, Professor of Aeronautical Engineering and Pro-Vice-Chancellor, who said: "Congratulations Roy... can I call you Roy now?"' That kind of formality is unthinkable now - it's a good illustration of just how different things were.'

'Collar represented (amongst others, including Professors Morrison and Shepherd) the emergence of a new personal style of academia in the Faculty. Collar took over as Dean from Professor Alfred Pugsley in 1954, a formal man whose Professorial trappings included having a mat outside his office door

(he was the only Professor in the Faculty to have this), as well as the requisite professorial carpet in his office. We (his juniors) were told that the mat outside Pugsley's door dated back to the significance of mats and carpets in the Civil Service hierarchy. Collar was less formal and was a personally engaging man of many talents: he wrote comic verse, which he performed publicly at every opportunity, and he was an accomplished footballer and cricketer. I myself played for the University Academics cricket club from 1956 until 1985 - in the mid-sixties, Collar was President of the club after he stopped playing. He would come along to our net practices - his skill was still very much in evidence '.

Things changed gradually to the way things are currently, but Professor Severn notes some key turning points along the way: '1968, with the students' revolt against the rigidity of the system was a key moment. But more important were the structural and technical changes to the teaching of engineering - the move from the 3 to 4 year degree following the Finnieston Report and joining Europe, for example'. The most obvious visible change to teaching was surprisingly basic: 'before the 1970s it was "talk and chalk" - quite literally, with some serious concerns raised about the medical effects of the clouds of chalk that this generated in lecture theatres! As time has gone on overhead projectors were developed and now, of course, PowerPoint.'

'A student of 1956 dropping into the Faculty now would be astonished at the technology of teaching and the relaxed atmosphere between staff and students - a student of today would probably get even more of shock if it was the other way round...'

centenary



PERRY ROBBINS



**John Bracey is the Faculty Teaching Facilities/Technologies co-ordinator and is one of our longest serving support staff**

In July 1969 having just left sixth form (at Henbury School) I was interviewed for a post as a junior Technician in the School of Architecture. The interview went well I thought, but as it was with the University in those days, there was no follow up letter to confirm this. As a consequence I accepted

a position with a local Engineering firm. It wasn't until September when I had settled into this job that I finally received my letter of confirmation for the appointment in Architecture! The move was made and since then I haven't looked back. At the time I was younger than the students - how I enjoyed meeting those interesting, friendly and understanding personalities. Working was a pleasure, enjoying worthwhile research into building problems using very expensive industry-standard measuring equipment, all of which was valve based.

We had a Hydraulic Analogue Computer needing 24-hour attendance, and later, in the 1970s, a Commodore Pet and Wang computer. Professors were addressed as Sir or Prof with a little tug of forelock. There was a smell of ammonia from the dylane printer, and all printing for lecture notes was done with a Roneo Stencil machine wound by hand. Architecture was a thriving department with excellent students, and strong links to voluntary community projects. The furthest away of these was in North Wales, 'Building the Festiniog Railway Deviation', and I was involved with this project for thirteen years.

There were many highlights during the working year: The Founders Day Fete at Coombe Dingle for all staff and their families; Student Rag week - climbing Park Street with rope & crampons, and racing homemade craft launched into the Docks; the 24-hour pedal car race at the Old Whitchurch airfield; Student vs staff sports, especially the cricket where we took on the vets at Langford and the researchers at Long Ashton. But alas, as

a result of the University cuts in 1981 the Department of Architecture was closed.

Soon after, in 1982, I had a successful interview with Professor Mike Bird for a position within Engineering and Geology (the two departments were then housed together in the Queen's Building). I was immediately struck with Engineering's vast size having so recently worked from a Georgian cottage in Little George Street, which would have easily fitted into the Geology museum (now the Central Design Office).

The main audio visuals I was involved with then were 16mm film and 35mm slide projection, with the occasional use of the Carbon Arc projector. I very much enjoyed my involvement with undergraduate admissions.

Since I have been in Engineering, changes have been many and varied. The departure of Geology and subsequent arrival of the Computer Science department, was one such change in which reorganisation of space resulted in the loss of twenty toilets, the Ladies rest room (with chaise longue and full length mirror), the First Aid room and solid teak BT phone box!

During my time here I have met many local dignitaries and VIP visitors to the Faculty, and have worked with wonderful, talented colleagues enjoying a unique camaraderie. The time has passed quickly with hardly a dull moment but, as Dick Clements once said, the University has its seasons as in life.

And I have experienced forty years' worth!

**Roy Severn Emeritus Professor of Civil Engineering**

**John Bracey Teaching Facilities and Technologies co-ordinator**

**Roy Severn with Roderick Collar in the early 1980s**

**John takes a break on the roof of the Botany department 1970**

The Sonotweezers team: Drs Mark Gilbertson and Paul Wilcox with Professor Bruce Drinkwater

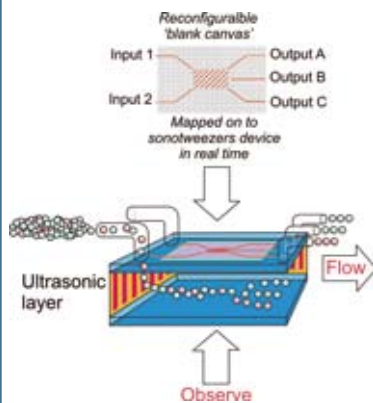
Sonotweezers concept - reconfigurable ultrasonic force field



# Sonotweezers

## programme grant

Bruce Drinkwater from the Department of Mechanical Engineering describes the development of 'Sonotweezers'



A team from the Department of Mechanical Engineering is leading a new £4.2 million EPSRC Programme Grant. This project aims to develop new technology, called Sonotweezers, which ultrasonically manipulate microscopic particles such as cells. Bruce Drinkwater is the overall project leader, Paul Wilcox will lead the effort to model the new devices and Mark Gilbertson will seek to understand the fundamentals of the interactions of ultrasound with particles and the effect of particle-fluid and particle-particle interactions. The Programme Grant is very much a collaborative effort, involving researchers from the Universities of Dundee,

Glasgow and Southampton with a range of companies that represent both the supply chain (Loadpoint, PCT and Weidlinger Associates) and end users (DSTL, Genetix). The team has the range of skills needed to develop a fundamental understanding of ultrasonic particle manipulation, and progress the technology to a usable device integrated on a silicon chip and trial it on a number of biological applications.

Optical tweezers have already demonstrated the potential value of microparticle manipulation and the Sonotweezers concept is designed to complement them. Expected benefits include the application of larger forces over a larger scale as well as more straightforward integration with a silicon platform. Professor Drinkwater added: "Various groups have demonstrated the basic principle of ultrasonic particle manipulation and, like the work on optical tweezers in the 1980s and 1990s, the race is on to develop devices that best exploit this phenomenon." For example, in tissue engineering we can potentially bring together small populations of cells and construct multi-layered structures that accurately replicate such things as the lining of the lung. Whilst optical tweezers offer the potential of doing this cell by cell, Sonotweezers can operate on groups of tens or hundreds of cells and hence produce

artificial tissue on a much larger scale. There is also an opportunity to bring both optical and ultrasound devices together and work across a very wide range of length scales from nanometers to centimetres. We are not alone in wanting to do this: ultrasonic particle manipulation is already a rapidly developing area with simple microscale filters already in existence. However, these systems are limited because they rely on ultrasonic resonance, effectively fixing the force potential field in a given test-cell. Particle movement is then achieved by physically moving the transducers. In Sonotweezers the team will design, make and test devices with no moving parts and gain fine control of the ultrasonic force field through an array of multiple ultrasonic transducers.

The team believe the electronically controlled Sonotweezers could be used in a vast number of applications. The project will take a look at some of these: in tissue engineering we aim to construct increasingly complex and large scale structures to replicate lung tissue; in forensic science and homeland security, we aim to improve cell and bacteria sorting and counting. Successful outcomes in any of these early applications will undoubtedly lead to new ones.

research



# Cool ice pigs clean up the water supply!



**Delivery Lorry containing 10 tonnes of 'ice pig'**



**Ice pig leaving a mains water pipe.. Yes this is the water you drink!! But now that the ice pig has cleaned out the pipe it's a lot better**

**Even the water company employees are amazed at the efficiency and effectiveness of ice pigging**

Pioneering work by the Mechanical Engineering Department and Bristol Water has led to an innovative technique using ice being developed to clean potable water mains. Traditionally, polyurethane foam swabs known as solid plugs or pigs were propelled through the main with water, scouring the pipe clean as they went. These traditional pigs need expensive and difficult to install pig launch and receive stations. Trial work shows that "ice pigs" eliminate the problems associated with conventional pigging.

Ice pigging involves cleaning by injecting ice slush into a rising main before forcing it through the pipe with water, and removing the ice pig from a downstream rising main. The process is safe, fast, and economic. Further, it can be guaranteed never to leave a stuck pig in the pipe (the 'pig' would simply melt).

Bristol Water is trialling the process within its network and will clean over 30km of mains pipe by the summer. All the indications suggest that the process is becoming the potable water pipe cleaning technique of choice for the Water Industry. The live trials are being lead by Nick Haskins and Graham Norton within Bristol Water. In the University, Eric Ainslie, Martin Herbert, Tim Deans, Dom Ash and Joe Quarini are providing technical support and are continually improving and developing the technology.

The technology represents a paradigm shift in pipe cleaning, making difficult, time consuming and expensive tasks easy and fast to undertake as well as making some previously impossible jobs possible.

Joe Quarini



**Joanne Fryer  
Press Officer for the  
Engineering Faculty**

## Promoting our research

The University of Bristol has an exceptionally high profile in the media. There are two main reasons for this: first, the sheer volume of newsworthy research and other interesting activity that takes place here; second, the fact that there is an energetic Press Office working alongside colleagues - especially academics - to get Bristol's story across.

The Press Office comprises five members of staff who between them have decades of experience in proactive and reactive media liaison. The team forms part of the Public Relations Office, which is led by Jill Cartwright and includes specialists in corporate web and new media development and the production of University publications. (The Public Relations Office is in turn one of three departments in Communications and Marketing Services, but that's another matter...)

The Press Office's main role is to communicate the University's key messages to local, national and international audiences by maximising positive media coverage about the University and its achievements in order to help maintain and enhance its reputation as a dynamic, world-class, research-intensive institution.

The Press Officers are always keen to hear about new research, research bids, publications and events which they can publicise both through the external media

and, in conjunction with the other teams in the PR Office, through re:search magazine, other University publications and, of course, the web.

Talking of which, the PR Office is proud of the fact that although resources are tight, it has established a rather sophisticated online news service (see [bristol.ac.uk/news](http://bristol.ac.uk/news)). This is a showcase for all manner of projects, people, developments and successes at the University, and attracts a high volume of page views per week.

The Press team is keen that more academics should join the Directory of Experts, which contains details of academic staff who are willing to speak to the media as authorities on particular subjects. It has also proved a useful tool for other academics, both at Bristol and in other institutions, looking for collaborators. If you would like to join the Directory, select 'login' from the link on the Directory of Experts website.

The Press Office - and, indeed, all staff in the PR Office - are here primarily to support academics and want to hear about their work. Don't hesitate to get in touch.

**The Press Officer for Engineering is Joanne Fryer, (Monday-Wednesday)  
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GARRAD HASSAN

## Wind Powered Vehicle launch

The Faculty of Engineering is about to launch an exciting new project in partnership with the leading wind turbine consultancy Garrad Hassan. The Aeolus Wind Powered Vehicle Project will involve designing and building a vehicle to enter both the 2010 and 2011 Aeolus Wind Powered Car Race in the Netherlands (<http://www.windenergyevents.com>).

Vehicles in the Aeolus race must be powered by a turbine, enabling them to travel directly into the wind. A cross-Faculty team of undergraduates will begin work on the vehicle's preliminary design over the summer, supported by academics from Aerospace Engineering, Electrical Engineering, Mechanical Engineering and Engineering Design, in addition to Garrad Hassan staff. This will be continued next term through a range of dedicated research projects investigating specific aspects of the vehicle's design.

**The Aeolus Wind Powered Car Race 2008 attracted entries from across Europe**

**David Lammy MP together with Professor Paul Valdes (far left) Professor Alan Champneys (left) and Mr Jeremy King (right)**

**Bernard Stark explains his research to David Lammy**

**The 2008 race teams perform final preparations**



GARRAD HASSAN

# Skills Minister visits Faculty

David Lammy MP takes a look around the BRITE Futures institute



On 7th May, the Faculty hosted a visit by David Lammy MP, the Minister for Skills at the Department for Innovation, Universities and Skills. He was met by Professor Alan Champneys, Head of Engineering Mathematics, who provided an overview of the BRITE Futures Institute (BRistol Technologies for the Environment) and how development of this initiative will help address skills shortages within the Environmental Technology Sector. To highlight the multidisciplinary nature of BRITE, Professor Paul Valdes from the School of Geographical Sciences also described the University's expertise in relation to global climate modelling and understanding climate change. David was then shown a selection of industrially linked undergraduate and postgraduate projects within Professor Phil Mellor's Energy Management Group. This included the demonstration of a hydro energy device

for powering transmitter stations in remote locations, which has been developed by a team of five Engineering Design students in collaboration with Motorola.

Environmental technologies are also a strong focus of many of the industry led projects run through the Faculty's Engineering Doctorate Centre in Systems ([www.bris.ac.uk/engineering/systemsengd](http://www.bris.ac.uk/engineering/systemsengd)). The Engineering Doctorate is an alternative to the traditional PhD, being better suited to the needs of Industry, and providing a more vocationally oriented research and teaching programme.

**For further BRITE news and forthcoming events, please visit [www.bris.ac.uk/brite](http://www.bris.ac.uk/brite)**





# From the Engineering Archives

*This photograph of staff and students in the Faculty was taken outside the main entrance of the Society of Merchant Venturers Technical College situated off Park Street in Unity Street*

At its inception in 1909, and until Queen's Building was occupied in 1955, the Faculty was housed by the Society of Merchant Venturers in its Technical College in Unity Street, and was maintained by it financially at a decreasing rate as Government funding became available.

The Faculty prospectus for 1930 describes these premises thus: 'the main building of the college consists of a ground space of 2388 square yards. On the ground floor there are the Civil Engineering Laboratories, the Mechanical Engineering Laboratories and workshops, one of the Electrical Engineering Laboratories and the Automobile Engineering Laboratory. On the first floor there are the Offices, the Governors' and Principals' Room, Registrar's Room, Lecturers' and Students' Common Rooms, another Electrical Engineering Laboratory and the Great Hall. On the second floor are the Mechanics Laboratories, Drawing Offices and various Lecture Rooms'.

This photograph, which shows the whole of the Faculty including undergraduates, can be dated at sometime between 1919, when Andrew Robertson joined as Professor of Mechanical Engineering, and 1924 when Julius Wertheimer died. The latter, with drooping moustache, is seated in the centre of the front row, with his feet on the doormat to denote his status as Permanent Dean of the Faculty, as well as Principal of the College. On his right are Professors Robert Ferrier (Civil) and Andrew Robertson (with arms folded across his chest) who was to take over as Permanent Dean until 1949 when he retired, and who was responsible for transforming the Faculty from a local teaching institution, to one with a national research reputation. In so doing, he was able to recruit such outstanding Engineering Professors as Pippard, Baker, Pugsley, Collar and Rawcliffe, all of whom (like Robertson himself) became Fellows of the Royal Society.

Returning to the photograph, to Wertheimer's left are, in order, Professors David Robertson (Electrical), William Morgan (Motor Car) and Edward Boulton (Mathematics). The names of others in the front row were not recorded. The formal dress of everyone should be noticed, including academic gowns, but the man smoking a pipe at the end of the second row was possibly putting his degree in jeopardy!

Sharp eyes will notice the young lady in the back row. Equality of the sexes was a founding principle of the University in 1909, but it was not until much later that the Faculty prospectus contained a section specifically directed to female students. This did not have the desired effect, and even as late as 1976 there were still only 22 female students in a total of 450 undergraduates.

**The Faculty staff and students, courtesy of the University Special Collections**

# people



**Dr Simon McIntosh-Smith**

**Prof Dan Inman**

**Dr Konstantin Blyuss**

**Mr Peter Foster**



**The Faculty is always pleased to welcome new members of staff. Here we feature a few of the latest arrivals**

**Simon McIntosh-Smith** has joined the Faculty as a Senior Lecturer in High Performance Computing and Architectures. Simon's background is architecture design in industry; he started his career at INMOS before moving to Pixelfusion to develop the world's first true GPGPU in the late 1990s. He was a founder member of ClearSpeed where he led the architecture and applications teams that produced the CSX family of many-core processors. Their latest product, the CSX700 was the fastest double precision floating point processor (according to DGEMM) when introduced in 2008.

The University has made significant investments in High Performance Computing and storage and Simon will provide the academic leadership for this activity. He has well established links with colleagues in Chemistry, Physics and Biochemistry and thus is ideally placed to lead this university-wide initiative.

Simon's research interests are centred on many-core computer architectures and their use in various high performance computing problems. Of particular interest are applications in life science such as molecular dynamics, quantum mechanics and genome sequencing. He holds eight patents in hardware and software, is a big fan of Terry Pratchett, and is a keen motor sport and German sports car enthusiast.

**Dan Inman** joined the University as the Brunel Professor of Intelligent Materials and Structures in the Department of Mechanical Engineering. This is a partial appointment and he shares his year between Bristol and Virginia Tech in the United States where he is the Goodson Professor of Mechanical Engineering and Director of the Center for Intelligent Material Systems and Structures. His work uses smart material systems and structures to solve vibration and control problems for mechanical, aerospace and civil systems.

Professor Inman enjoys hiking in Dartmoor when in the UK and walking with his Golden Retrievers on his farm when in the US. He also enjoys travel and visiting his former PhD students who are scattered in academic positions around the world. He is married with three adult children and five grandchildren all of whom reside in the US (Virginia and North Carolina). Dan also enjoys writing books (nothing too exciting, just the usual technical stuff!)

**Konstantin Blyuss** is a Lecturer in Complexity Sciences in the Department of Engineering Mathematics. Prior to this, he worked as a Lecturer in Applied Mathematics in Keele University.

Being a theoretical physicist by training, Konstantin has developed a keen interest in using mathematical tools for studying real-life problems. He did his PhD at the University of Surrey in the area of applied dynamical systems, focussing on understanding the

mechanisms of spatio-temporal chaos. Following this he was a Postdoctoral Research Fellow in the University of Exeter, where he used mathematical methods to study the dynamics of phase-change processes in optical data storage media. During this time he became interested in biological problems, and did another PostDoc in the Department of Zoology, University of Oxford, where he concentrated on mathematical modelling of the spread of epidemics, such as dengue and malaria. While being quite different in terms of application areas, all these problems posed interesting challenges in applied mathematics.

His current research interests lie mainly in the area of mathematical biology and epidemiology. He uses mathematical tools to understand the mechanisms of various infectious diseases, interactions between multiple pathogens, as well as immunity. Problems that arise in biological and medical sciences require the development of new mathematics, and for Konstantin this is both challenging and exciting.

**Peter Foster** is the Faculty Project Manager for EF21. He graduated in Geography at the University of Birmingham, and took his first 'proper' job there. He found himself housed in an office off a long shiny floored corridor in a 1950s brick built, stone dressed construction, not at all dissimilar to the building, and indeed the office he finds himself working in all these years later.

After looking after the department's laboratories and field excursions for a while, Peter decided to head out into the big wide world and after completing a government retraining course in commercial computing joined Barclays Bank as a trainee programmer. He spent five years gaining an excellent grounding in taking structured approaches to designing and developing systems solutions to business problems.

That experience was put to good use in both permanent and contract roles, as he worked through the ranks of programming, team leading, systems analysis & design, to business analysis and project management. More recently, Peter worked as a business consultant for the MOD, on a major change management initiative. He spent two years at UWE, procuring, customising and implementing an enquiries and admissions system, and last year was engaged to do some generic management consultancy at the Open University.

His wife and youngest daughter attend Bristol Grammar School, albeit in slightly different capacities! This is particularly convenient in terms of getting a nearby parking space, although they live sufficiently close by that walking to work is also an easy option.

Peter's spare time activities are based around running. He competes regularly in orienteering competitions, and is actively engaged in their organisation. Peter also enjoys running in wild upland areas, and has competed in numerous mountain marathons.



# Speaking personally

## Anne Thorpe is the Administration Manager for the Department of Civil Engineering

Interview by Melissa Bevan

### What is your earliest memory?

I can remember snatches of things rather than fully formed memories. I grew up in rural Nottinghamshire miles from anywhere, and most of the memories are to do with animals - some nice and some sad. I remember being allowed to feed new-born orphaned lambs with a bottle, but I also remember seeing a chestnut mare unable to get up from the frozen cobbles on which she had fallen. I remember we used to look out of the kitchen window at dusk to see huge clouds of bats swirling around. I always kept my shutters closed for fear of them getting into the house and into my hair!

### What did you want to be when you were a child?

You mean apart from a princess? Grown up, I suppose (do you think there's still time?)

### Describe yourself in four words?

Talented, gifted, beautiful, intelligent, fearless, female - no mathematician!

### Where and when were you happiest?

I'm happiest nowadays - particularly on Saturday afternoons, working on my allotment on a warm sunny day in the peace and quiet. I grow vegetables and flowers (mainly dahlias). The high spot is sitting down with my allotment neighbour, surveying our efforts at the end of the day.

### What are you most proud of?

Maybe that I was the first person in my family to go to University. And also that I'm always up for a challenge - I did the Bristol Half Marathon for the first time two years ago in just over 2 hours - I'm still worn out!

### What single event has most changed your life?

The invention of hair straighteners!

### Which item would you save if your house was on fire?

My hair straighteners of course!

### Which living person most inspires you?

Ordinary people who don't have a lot of time or money, giving up their time, on a daily basis, to help others. I think this is far more generous than donating money.

### If you could come back in another life, who or what would you be?

A singer - probably an opera singer. I'd love to be able to sing as well as Angela Gheorghiu (an excellent soprano) but unfortunately I can't hold a tune.

### Classical, jazz or rock?

All three - I have a very eclectic taste, ranging from 70s rock to the operas of Verdi and the Bach cello suites. I went to a lot of punk concerts when I was younger, but now listen more to folk and jazz. Bob Dylan is an enduring favourite who is still making great music today.

### What would you like more of?

Living in Bristol, I would have to say "sunshine".

### Favourite place in the world?

At the top of a mountain in the Lake District. If I can't get to Wales or the Lake District, I can usually be found at local "high points"

like Glastonbury Tor, Kelston Round Hill, the White Horses in Wiltshire, King Alfred's Tower at Stourhead or Dundry - basically anywhere to get a better view of the world.

### Where would you rather be now?

Running on the Bristol to Bath cycle path. Or at the other extreme, lying on my sofa reading a book and listening to The Smiths while eating a mega cheese, ham, tomato (and chutney) sandwich and drinking a large mug of tea (I can multi-task).

### What is the best piece of advice you've ever been given?

Keep out of the reach of children!

### What makes you smile?

Loads of things - that smell of hot tarmac on a summer's day after rain, the smell of orange blossom (philadelphus or "mock orange"), waking up on a sunny day, babies (other people's), new-born lambs, puppies... the list goes on.

### What worries you?

The possibility that I might forget who I am one day.

### How would you like to be remembered?

"She had nice hair!"

### If money were no object I'd...

Buy a smallholding and keep animals. And complete my "collection" of William Curtis's Botanical Magazine published in 1785 - so far I only have one volume! And buy an original Degas for my living room wall - preferably "Combing the Hair" - which depicts a maid combing the hair of a young woman. I like the different hues of red in that painting.

Tom Richardson and the National Air and Space museum, Washington

The final six, left to right: Luca Parmitano, Alexander Gerst, Andreas Mogensen, Samantha Cristoforetti, Timothy Peake, Thomas Pesquet. Credits: ESA - S. Corvaja, 2009



# The Space race - it could be you!



*In May the European Space Agency selected their final six recruits following a Europe-wide recruitment process that started last year. Following thorough psychological, medical and professional screening that started with 8413 valid applications they are the first new recruits to join the European Astronaut Corps since 1992 under this second-ever astronaut selection carried out by ESA. To his incredible credit our own Tom Richardson, Lecturer in Flight Mechanics, Department of Aerospace Engineering, made it through to the last 45 possibles*

There are very few jobs on Earth that I would leave the University of Bristol for, so it was with some surprise that I found myself filling out a job application form in May of last year. Academic history, current job, references, all fairly standard stuff, but one of the later questions asked me what I thought the life of an astronaut might include. 'ESA Astronaut'? How many of us have watched the early Apollo moon landings and wondered what it would be like to ride in a spacecraft through the Earth's atmosphere and beyond? Although I had thought a great deal about it in the past it was only when the Europe wide call from ESA went out that I, along with almost 10,000 others, thought I might be in with a chance!

A few weeks later it was fantastic to receive an email with an invitation to Hamburg for the first round selection and the aptitude tests. A whole day aimed at finding our limits in terms of mental arithmetic, memory, logic, spatial awareness and hand-eye coordination. Coming back home, it was then a couple of very long months to find out that I had been invited back to Cologne as part of the 192 still remaining for the next stage and the psychological tests.

Returning to Germany I had no idea what to expect but in the end had a fantastic time, meeting current astronauts, being interviewed, and being tested once again to the limit as ESA continued to whittle down the list. Back in England the waiting continued until the email came from 'astronautselection@esa.int' with the subject line 'Congratulations!' such a simple thing can put you on an amazing high!

I was now down to the last 45 and flew out for the second time to Cologne, this time for quite definitely the most expensive, thorough (sometimes uncomfortable!), physical examination I will ever have. Despite the prodding, probing and testing it was a really enjoyable week with a small group of astronaut candidates all going through the same battery of challenges!

Unfortunately that's where my quest ended, but I will never forget the experience and the people that I met, including astronauts from the USA, Russia, Japan and of course ESA. I wish all the best to the six final candidates, in particular to the British candidate Tim Peake, and to Thomas Pesquet from France whom I met during the medical in Cologne.