Welcome to the Spring 2015 Edition of Mech Eng Matters, hopefully the signs of Spring will be with us soon!

We hope that your Semester 1 examinations went well and that you enjoyed the inter semester break!

You will have noticed that construction of the new Faculty Building 4ES has started in earnest and it will be a welcome addition to the Faculty when it opens in 2016. It will result in us being able to have more staff offices and studio space in 4E when the staff and students from Architecture and Civil Engineering move into the new building.

Work will commence in early summer on refurbishing the Water Tunnel Lab and the large Low Speed Wind Tunnel and this will complete the work that has transformed the appearance and quality of our lab spaces over the last four years.

We hope you will find this edition of Mech Eng Matters interesting in giving you some insights into some activities of staff and students in the Department over the last few months.

Robert Bryant Lecture

The Centre for Orthopaedic Biomechanics hosted a Public Engagement Event to launch the Robert Bryant Lecture at the Bath Royal Literary and Scientific Institute on Tuesday 28 October.

Robert Bryant is a Bath Mechanical Engineering graduate who suffered a severe spinal injury in an accident and thanks to his own determination and the medical treatment he received, he is now back to his active lifestyle. In recognition of the medical care he received Robert gifted a sum of money to the Centre for Orthopaedic Biomechanics at Bath. This gift provides an annual prize for the best final year biomechanics project, a fund for PhD students to support attendance at international conferences and funding to support an annual public lecture to promote biomechanics research.

The launch event “Turning our backs on pain” attracted around 70 members of the public and university staff and students. The event was chaired by Professor Tony Miles, Director of the Centre for Orthopaedic Biomechanics and included a presentation by Robert Bryant who gave an account of his injury and medical treatment.

Professor Mike Adams from Bristol presented a talk on the Biomechanics of Pain, followed by presentations from Mr Otto von Arx, a Bath Consultant Spine Surgeon on Clinical problems and treatment options and Dr Sabina Gheduzzi from Bath University on Biomechanical studies of the spine.

Tony Miles speaking about the event said “The event was a great success and the mixture of presentations from a patient, a surgeon and researchers proved to be an excellent format for our future annual Robert Bryant Lectures”.

Graduates Progressing their Inventions

Paddy is working on a new app-controlled MIDI controller for live music. Chris is developing a novel 6-axis controller which can be applied in many contexts from drones to heavy machinery.

The department hosts, supports and follows their progress towards possible businesses.

Final year students can apply for the 2015/16 Innovation bursaries during May following the outcomes from their Final Year projects or Specialist Design projects.

For more information contact Prof. Gareth Jones - G.Jones2@bath.ac.uk
Hello to...

Alison Parker who joined us in December 2014 as Departmental Secretary

Jamie Turner who joined us in January 2015 as Professor of Engines and Energy Systems

Francesco Ciampa who joined us in December 2014 as an academic lecturer

Congratulations to...

Dr Alicia Kim and Dr Sam Akehurst to Reader

Dr Andy Hillis on the birth of his second son born on 3rd February 2015

Jos Darling on converting his civil ceremony to marriage on 10th December 2014

Kate Fraser on the birth of her son Oscar John Fraser Baker on 12th February 2015.

Game Design Research

Dr Elies Dekoninck and Chris Shaw are working on a short project with game designer Alex Fleetwood. The game (for children 8-12 years) is a novel combination of tangible physical parts and a tablet-based interface. Chris has developed a smart sensing platform and has been using the department’s rapid prototyping facilities. The project is an ‘internet of things’ demonstrator involving a multidisciplinary team with: game designers, software engineers, electronic engineer, industrial designers and a graphic designer. The third iteration of the prototype will be exhibited at the Pervasive Media Studio in Bristol at the end of February. The project is funded by the Arts and Humanities Research Council. For more information contact Elies Dekoninck – e.a.dekoninck@bath.ac.uk

Secondment to North Carolina State

The Department of Mechanical Engineering is continuing to strengthen its relationship with a number of high profile international universities.

To this end, new lecturer in Engineering Design, Dr. Vimal Dhokia was recently seconded to North Carolina State University as an Adjunct Visiting Professor within the prestigious Edward P. Fitts Department of Industrial and Systems Engineering. Vimal was an active member of Professor Richard Wysk’s hybrid manufacturing research group that is leading research into combining additive and subtractive techniques for a new synergistic manufacturing approach. In particular, the hybrid manufacture of custom animal prosthetics costing in excess of $70K was an intriguing aspect of the group’s current research! These developments are transforming the way products are being manufactured and have impacted directly on Vimal’s current research.

Whilst he was a member of the faculty, Vimal engaged with a wide range of teaching and research, and in particular the generation of a research roadmap between Bath and NC-State. Already Royal Academy of Engineering and Innovate UK funding (project FALCON) has been successfully gained to enable academics from NC-State to visit Bath, and continue the development of a collaborative research agenda aligned to emerging design and manufacturing technologies.

In addition to academic pursuits, Vimal also found time to partake in the US pastime of American Football and supported the local NC-State university team – “The Wolf Pack”! Whilst he didn’t really understand what was going on, he did appreciate the razzmatazz and cheerleading!

Conference in Peru

In November Dr David Cleaver represented the Department at the Magalhaes Network conference in Lima, Peru.

The Magalhaes Network is a consortium of Europe and South American universities established with the purpose of encouraging greater international collaboration across the network. Every year in parallel to the general assembly the network hosts a discipline specific workshop. This year’s topic was aerospace teaching and research. This involved two days of discussions followed by a private tour and meal at the Museo Larco, an impressive colonial mansion that houses Peru’s finest archaeological collection and is rated as Lima’s primary tourist attraction.

Next year’s workshop is likely to be green energy in Lisbon.
WES Conference - Women in Engineering

On the 15th of November, 150 female students and 50 engineers (of both genders) from across the UK converged to celebrate their shared passion of engineering and technology at Aston University during the sixth annual WES Student conference. Second only to the hosts, with 16 delegates, the University of Bath had a strong presence at the conference.

With ‘Engineering Inspiration’ as its motto, the conference aimed to create a dynamic environment that fosters career confidence amongst the attendees. This was accomplished through a number of panel discussions, talks and workshops that covered resources that every aspiring engineer needs in their toolkit, from roles models to career-life balancing strategies and self-awareness skills.

As one of the first student groups to be officially affiliated with WES, the WES Bath student group was given the opportunity to share the story of its journey as a means of inspiring other students to follow suit. The group chair, Mendy Mombeshora, gave a well-received talk that covered everything from the group’s inception to the activities that it has conducted so far.

Overall the conference proved to be a success for the University of Bath delegation, with individual students getting the opportunity to network and gain insights into their future careers and the WES Bath group forming links with other student groups from across the country and hopefully inspiring other students to form their own groups.

Composite Research hits the spot on Airbus Wings

At a recent Impact Celebration event in Bath’s Pump Rooms, the Composites Research Unit and GKN Aerospace were presented with an Impact Award in as recognition of their joint research that is helping with the design and manufacture of composites wings on new Airbus airliners. The research is being undertaken under Prof Richard Butler’s Royal Academy of Engineering Research Chair with the company, which commenced in 2013.

On receiving the award, Richard said that “the close relationship with GKN started with a RAEng secondment with the company. Four years later, it is thrilling to be working with such a forward-looking company, making great strides in the technological development of aircraft; a fine example of British manufacturing. This collaboration has led to over £2m investment in composites research at Bath, new links with Mathematical Sciences plus a range of new opportunities for staff and students.” Ian Lang, Head of Analysis at GKN, added that “Our drive is that of a delivery-focused manufacturer and although there is an inherent culture of problem solving, it is often difficult to put the science or maths behind the processes that create these manufactured products. The relationship with Richard’s team has allowed GKN to discretize engineering issues into their constituent parts; assessing the impact of elements on the whole. As GKN seeks to build partnerships between its businesses around the world and their local universities, the relationship with Bath provides us with the benchmark for effective engagement with academia.”

Bath UAV Team gears up for the IMechE UAS Challenge

This summer a group of 4th year Aero and IMEE students will be entering the inaugural competition for the IMechE Unmanned Aircraft System Challenge. The goal is to design and build a fully autonomous aerial system that can fly up to 60km, identify ground markers, and deliver a payload with pin-point accuracy.

Following in the hugely successful footsteps of Formula Student, this new IMechE competition seeks to create a similarly rewarding student experience for the aerospace sector. The idea behind this year’s competition is to design a system for fast and flexible delivery of humanitarian aid in the immediate aftermath of a natural disaster. Through the Aerospace Group Business Design Project this year’s team have already designed the aircraft. It is an impressive 2.2m wingspan carbon fibre blended wing body that will cruise around 70mph. They now have five months to optimise the design, build and then commission it before the competition in June 2015! The team have so far received support from the Alumni Fund, CNC-step, and the departments of Mechanical and Electrical Engineering, and are in discussions with a number of industry partners. In a couple of weeks the team will be moving into the newly renovated Autonomous Vehicles Lab, complete with a brand new CNC router for mould manufacture.

We wish them all the best of luck and look forward to hearing about their progress!
Jamie Turner has been appointed as Professor of Engines and Energy Systems from January of this year. He originally studied Mechanical Engineering at City University and undertook his PhD at Loughborough University; he was a Visiting Professor in the department for two years prior to joining the University. His career to date has been entirely in engine research and development in the automotive industry, and while he joins us from Jaguar Land Rover, most of his career has been spent at Lotus Engineering; he has also spent time at Norton and Cosworth Engineering.

At the beginning of his PhD thesis he said that ‘I am an unreconstructed internal combustion engine man, and this thesis is an embodiment of that fact.’ It will be no surprise that engines for motive power, and what they are attached to, are his passion, and that the spirit of innovation at Lotus has driven him to want to create new concepts in order to fuel progress in the area. He’s also spent a great deal of time on alcohol, researching methanol and ethanol as practical means to decarbonize transport energy systems without a requirement for society to move to gaseous energy vectors for transportation. Synergies and interactions between power plant and fuel are what he really finds fascinating, whether they be for heat or fuel cell engines.

As an engineer he has an unusual level of interest in history and finds airships fascinating; he also enjoys archery and spends at least part of his spare time motorcycling. He’s a hopeless enthusiast for all things Lotus, and probably devotes too much of his time to wishing he still had one...

New Professor - Jamie Turner

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6 Big Questions - Dr Andrew Rees

1. Favourite Quote?
Do to others only what you would expect them to do to you.

2. Favourite dish?
It has to be curry, any and every sort. I would be ecstatically happy with a 5/2 diet, five days curry, two days something else, with the occasional cassoulet Toulousain thrown in. Oh, and a full roast dinner of course.

3. Favourite book?
Tricky. But the gloriously slightly wacky prose and ideas that Douglas Adams used in the Hitchhiker's Guide to the Galaxy (original trilogy) have informed my lecturing style over the years. There’s also PKD’s stuff.

4. Favourite film?
With work and music filling up my time, I am generally happy with something escapist where I don’t have to think. Having said that, Life of Brian gives some pretty decent belly laughs.

5. Outside Interest.
See the picture! I lead both the Bristol Concert Orchestra and Keynsham Orchestra. I also play for Bristol Opera (Idomeneo this coming October) and dep for many others in addition to the occasional bit of chamber music and choral singing. I don’t know how I find time to research.

6. Who would you most like to meet?
I have the scientist’s persistent internal monologue: “Is this correct?”, “Is that accurate?”; “Do I really believe those conclusions?” Checking stuff out happens all the time even away from work. But apparently I now have a time machine, so I’m off to check out Roman-occupied Judea around AD30 armed with enough knowledge of Hebrew, Aramaic, Greek and Latin to be unobtrusive. Have those who have published on the topic got it right? Before the meeting I’ll need to snoop, sorry, research on how the Jews coped with both the occupation and their fervent Messianic expectations. And on how the focus of those expectations dealt with and related to different types of people. What was he actually like? Then the scary bit....