

think

Business with Birmingham
issue two

Manufacturing a new future

The University of Birmingham is a lead partner in the groundbreaking Manufacturing Technology Centre which is being built at Ansty Park near Coventry and scheduled to open in spring 2011. [See page 2](#)



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think advanced manufacturing

Driving forward research in manufacturing technology



Manufacturing Technology Centre

Learn more

www.the-mtc.org

Contact: s.b.taylor@bham.ac.uk

Representatives from industry attend MTC's inaugural business engagement event

The Manufacturing Technology Centre (MTC) being built at Ansty Park near Coventry is the result of collaboration between leading manufacturing companies and four world-renowned research partners (the Universities of Birmingham, Loughborough and Nottingham, plus welding specialist TWI).

With building work well underway, MTC's first business engagement event was held on Friday 8 October when chairman Terry Morgan welcomed more than 100 representatives from high-profile manufacturing firms (including ABB, Bombardier, Hewlett-Packard, Tata, Rockwell Automation and EADS). The event showcased some of the initial research programmes that will be undertaken at MTC, highlighting opportunities for companies to join founding members Rolls-Royce, Aero Engine Controls and Airbus UK.

A key benefit of MTC is that it will offer an innovation-rich environment to help bridge the gap between research and production. It will focus on finding solutions in netshape manufacturing; high-integrity fabrication; advanced tooling and fixturing; intelligent automation and process modelling/digital manufacture.

Working at MTC, companies will be able to test new manufacturing methods, taking lab research to pre-production development before moving on to full-scale production within their own premises. This should reduce manufacturing costs, cut 'time to market' and boost productivity.



'MTC will provide unique facilities needed to explore smarter processes for high-value manufacturing.'

Professor Nigel Weatherill, Pro-Vice-Chancellor and Head of College at the University of Birmingham

Professor Nigel Weatherill, Pro-Vice-Chancellor and Head of the College of Engineering and Physical Sciences at the University of Birmingham, said: 'Universities are at the forefront of innovation and are key partners in this important collaboration. We can utilise our research base to help provide solutions to key industrial problems. MTC will provide unique facilities needed to explore smarter processes for high-value manufacturing.'

For Birmingham, the initial focus will be on leading projects using the University's world-class expertise in:

- net shape manufacturing of high-performance components in high-value metals
- the modelling and characterisation of advanced metals and their processing

Initial funding for MTC is coming from Advantage West Midlands and East Midlands Development Agency, with at least £90m further private and public sector revenue planned over the next ten years.



Image courtesy of the Fairhursts Design Group Ltd.

A race from the lab to Formula One



A University of Birmingham spin-out company, AdSurf Engineering, has developed innovative surface engineering technologies, with applications that include use in racing cars.

The company was founded in 2001 by the late Professor Tom Bell, then head of the Surface Engineering Group in the School of Metallurgy and Materials. Professor Bell had spent over 30 years on pioneering research, establishing an international reputation.

Following in his father's footsteps, Tom Bell Junior now leads the company. 'My father was passionate about his work and set out to bridge the gap between the blue-sky research he was involved in at the University and finding real-life applications and solutions for industrial problems,' he said.

Ad.Surf.Eng. (as it is known) has an impressive client list which includes Ilmor Engineering, a US producer of engines for NASCAR and Formula One racing cars.

Before consulting Ad.Surf.Eng., the titanium upgraded valves in Ilmor's cars suffered reliability issues over full race distances.

Using cutting-edge technology, Ad.Surf.Eng. converted the surface of the valves to a ceramic that provides high-surface hardness. The life of the valves was extended, without changing their dimensions or core material properties. Ad.Surf.Eng. calls this unique process 'ceramic conversion technology'.

Ilmor is just one of a diverse range of companies bringing its manufacturing issues to Ad.Surf.Eng. The team is currently working with healthcare giant Smith & Nephew, conducting final trials on a surface treatment to increase the durability of orthopaedic implants.

University of Birmingham spin-out companies

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think energy

Get set... **GO!**

'The significant time, cost and energy reductions associated with the new method will open up new product opportunities...'

Dr Samantha Jones, Casting Research Group

Researchers at the University of Birmingham have developed a new rapid production method for ceramic moulds used in investment casting.

In investment casting, a mould is built around a wax pattern of the item to be formed. This is currently a time-consuming process because several layers of ceramic materials have to be dried.

The new method adds super-absorbent polymers to the material. This rapidly gels the coat being applied and so instead of air-drying the mould, the binder/slurry moisture is trapped

within the polymers. The castings have identical dimensions to those produced in the standard way.

Laboratory trials have demonstrated that traditional casting production times can be reduced from as much as 45 hours to just 22 minutes. Full-scale industrial trials have shown that complex form super-alloy casting moulds can be produced in 2.5 hours, as opposed to seven days.

Dr Samantha Jones from the Casting Research Group at the University of Birmingham is behind the research. 'The significant time, cost and

energy reductions associated with the new method will open up new product opportunities allowing the industry to successfully compete with other high-volume forming methods such as forging, machining and welding,' she said.

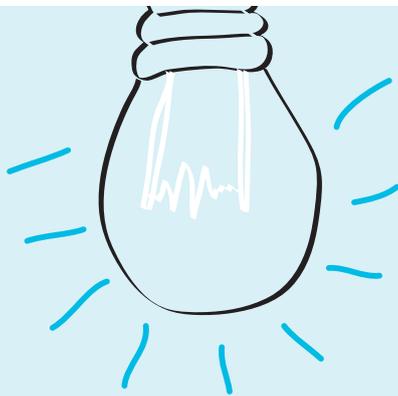
This is just one of the technologies available from Alta Innovations, the University of Birmingham's trading and commercialisation company.

Technology and intellectual property

Learn more

www.alta.bham.ac.uk

Contact: info@alta.bham.ac.uk



'The KTP with the University of Birmingham should make a strong contribution to our asset replacement strategy.'

Robert Ferris, Innovation and Development Manager for Central Networks

Knowledge Transfer Partnerships

Learn more

www.birmingham.ac.uk

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Keeping on the lights

A Knowledge Transfer Partnership (KTP) between the University of Birmingham and Central Networks is helping the energy company to devise an effective asset-replacement strategy, adapt to climate change and provide a reliable ongoing service.

Central Networks, which is part of the E.ON group, distributes energy to 10m people in central England through 133,000km of underground and overhead cables and via almost 94,000 substations.

Over 4,500 of these substation sites are in the Birmingham area, many of which contain transformers that were installed over 40 years ago.

If scientists can understand the various scenarios relating to climate change, including the effects of 'urban heat islands' (metropolitan areas which are significantly warmer than their surroundings), they can calculate the

life cycles of Central Networks' transformers and come up with the best possible asset-replacement strategy.

Under Dr Lee Chapman and Professor John Thornes in the School of Geography, Earth and Environmental Sciences, the partnership seeks to investigate the relationship between weather conditions and asset temperatures. Once these relationships are known, projections can be made for various climate scenarios so that asset life cycles can be approximated.

Robert Ferris, Innovation and Development Manager for Central Networks said: 'The KTP with the University of Birmingham should make a strong contribution to our future asset replacement strategy. Allowing Central Networks to determine how best to adapt to climate change impacts in urban areas will enable us to continue to provide a reliable network for our customers'.

This project is funded by the Technology Strategy Board along with other government funding organisations.

think environment



A new living concept that won't cost the earth

Civil engineers from the University of Birmingham are evaluating the thermal performance of a new type of durable, insulated house.

The Ergohome, situated on the University's campus, is an innovative living concept which includes built-in, robust sustainable features to address future housing needs. Made from structural insulated panels (SIPs) and a steel frame, it can be placed on stilts at over 2m above the ground.

The SIPs, which are used for the floor, walls and roof, are manufactured using a modern composite building material: a foam block sandwiched between timber sheathings. The insulation on all sides of the Ergohome delivers thermal comfort and its structure makes it resistant to physical damage and unstable ground conditions.

Inventor Paul Chadwick said: 'The Ergohome has the capability to address many of the issues related to housing today, including high energy efficiency and thermal comfort, low maintenance costs and carbon footprint as well as flood and subsidence tolerance.'

The Ergohome project has been made possible with funding from E.ON, Advantage West Midlands, West Midlands Centre for Constructing Excellence, EPSRC's Dorothy Hodgkin Award, Innovation Vouchers and Ergohome Ltd.

'The Ergohome has the capability to address many of the issues related to housing today.'

Paul Chadwick, Inventor

University researcher wins award from the Institution of Structural Engineers

University of Birmingham researcher Prathan Rugthonkit has been recognised by the Institute of Structural Engineers for his research into the behaviour of SIPs under both short-term and long-term loadings. The SIPs have been tested under many conditions to ascertain their strength, thermal performance and the overall energy usage required to maintain a comfortable living environment. The findings will be used to assess the implications for future SIP developments.

Innovation Vouchers

Learn more
www.birmingham.ac.uk
 Contact: businessteam@bham.ac.uk

Irrigating crops: how much and when?

The University of Birmingham provides a launch pad for innovative spin-out businesses and helps start-ups secure funding to get their ideas off the ground. One such venture, McBurney Scientific, was established to simplify the task of crop irrigation.

During his studies at Birmingham, Terry McBurney identified a gap in the market for a tool that would not only assess how much irrigation crops required but also how often.

'This is an important issue for farmers who typically spend up to £50k per annum on irrigating their crops,' he explained. Since its launch in 2006 McBurney Scientific Ltd has developed robust, low-cost instruments which monitor plants' soil water status and allow farmers to determine the amount and timing of irrigation required. The company has also developed a compact wireless system (known as T-Wave) which transmits readings for farmers to access remotely on the internet.

Terry said: 'Farmers typically over-water crops for fear of them wilting, so as well as the potential financial saving our products also bring an environmental saving. This is particularly important in hotter arid regions where water is at a premium.'

McBurney Scientific has developed a number of prototype systems which have been trialled across Europe and is now working on miniaturising and further automating its irrigation system.

The company is interested in hearing from private and institutional investors, as well as potential strategic partners in the agricultural sector, with a view to raising further funding in early 2011.

University of Birmingham spin-out companies

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think health

Partnership could aid development of anti-cancer drugs

A Knowledge Transfer Partnership (KTP) between the University of Birmingham and AstraZeneca could enable the development of new anti-cancer drugs.

Led by Professor Roy Bicknell (Professor of Functional Genomics at the University and Head of the Cancer Research UK Angiogenesis Group), the project will undertake molecular profiling of blood vessels to identify therapeutic targets (ie, finding out which molecules of a cell recognise and thus respond to a drug).

Professor Bicknell is a world-renowned expert in blood vessel formation (angiogenesis). His

team has developed many innovative cell-based assays and preclinical models to validate antibody-based therapeutics. His laboratory also devised a method for identifying novel therapeutic targets.

This knowledge will be transferred to AstraZeneca – one of the world’s leading pharmaceutical companies – to help it achieve its goals in developing successful anti-vasculature treatments.

Darren Cross, team leader of Cancer Discovery Bioscience at AstraZeneca said: ‘The KTP with the University of Birmingham should make a

Knowledge Transfer Partnerships

Learn more
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strong contribution to AstraZeneca’s aims for new medicines to combat cancer.’

This project received financial support from the Knowledge Transfer Partnerships programme. KTP is funded by the Technology Strategy Board along with other government funding organisations.



‘This will put us at the forefront of international cancer research.’

The former Rose Garden site at the University of Birmingham is soon to be home to the pioneering Human Biomaterials Resource Centre. Dr Jane Steele, Director, talks about why this centre will be so important for biomedical research.

What do you do?

My background is cancer research which I have been doing for more than 20 years. My role now is to work in collaboration with local pathologists, surgeons and other hospital personnel to collect, store and catalogue human tissue.

What is the Human Biomaterials Resource Centre?

The centre is a human tissue biorepository dedicated to the collection and storage of a wide variety of appropriately consented high quality tissue and body fluid samples for use in biomedical research. Through the Science

City initiative we received £3m funding support to help develop the first human tissue bank in the West Midlands. The facility is licensed by the Human Tissue Authority and is due for completion in the Spring of 2011. The unique strength of the centre will put us at the forefront of international stem cell and cancer research.

Why is this facility unique?

We have such an ethnically diverse population in this region, from whom we can collect tissue samples and tackle rare illnesses and conditions. Most tissue banks are focused on a particular disease or a particular sample type, but we will spread our net much wider, so that we can support the biomedical research that is going on in the region.

What benefits will the centre deliver for researchers?

It is much more difficult to carry out research using human tissue due to new legislative

Birmingham Science City

Learn more
www.birminghamsciencecity.co.uk
 Contact: c.potter@bham.ac.uk

guidelines. The centre will make it much easier to access samples from the regulatory point of view, and will quality assure all of the material released. The centre has received ethical approval from an NHS research ethics committee and individual researchers accessing tissue will generally not be required to seek project-specific approvals.

How will the centre work with industry?

The focus is on translational research which will hopefully provide direct help for patients. This will include the development of new diagnostic and predictive biomarkers, and new therapies and treatments. Although we will prioritise the needs of local research teams, samples will also be available to external researchers, including those in the commercial sector.

think business

Enterprising Birmingham

Academics develop business skills with PricewaterhouseCoopers

Entrepreneurial academics at the University of Birmingham are developing their business planning skills through an intensive five day training programme supported by top professional services firms including PricewaterhouseCoopers (PwC).

In consultation with PwC, the University of Birmingham has developed a bespoke course, which focuses on honing the skills required to formulate a business plan to develop a commercially viable product or service. This involved delegates attending two modules of the University's Medici Training programme and an additional session run by Victoria Marcer and Ian Birch from PwC.

The Enterprising Birmingham – Business Plan Competition, launched with the aim of creating new business spinouts from the University's considerable research talent, invited both research staff and postdoctoral researchers at the University of Birmingham to demonstrate a great business idea based on their research interests. Sixteen business plan competitors were shortlisted and attended the two day business planning skills course.

Victoria Marcer, Corporate Finance Director at PwC commented 'It's great to be a part of such a worthwhile programme. We were genuinely impressed by the quality and breadth

Enterprising Birmingham

Learn more

www.rcs.bham.ac.uk

Contact: c.mansell@bham.ac.uk.

of ideas and jumped at the chance to help this talented group of budding entrepreneurs to turn their ideas into commercial enterprises.'

The business plans submitted will be further shortlisted by a group of both internal and external specialists and the finalists will be invited to present their ideas in front of a panel of judges at the Enterprising Birmingham Showcase on 13 January 2011. The Showcase, to be opened by Sir Dominic Cadbury is expected to be a lively demonstration of the entrepreneurial spirit of the University of Birmingham.

A large audience from both industry and academia is expected at the Showcase in January and if you would like to attend please contact us.



A joint venture

The University of Birmingham and medical diagnostics specialists, Abingdon Health Ltd, recently launched Bioscience Ventures, a new joint venture aimed at developing and marketing new diagnostics products for the healthcare and other industries.

Utilising intellectual property developed at the University of Birmingham, Biosciences Ventures will focus on developing new diagnostic tools for conditions such as genetic related diseases and various forms of cancer. These tools will have applications in many areas of medicine including infectious disease, drug testing and veterinary procedures.

Operating on the University's campus in Edgbaston, and through its established research reagent and services company, Alta Bioscience Ltd, Bioscience Ventures will also provide a variety of services such as analysis and synthesis of DNA, protein and other biochemicals to clients in the pharmaceutical and food industries. The new joint venture will be led by Executive Chairman, Dr Chris Hand, who has more than 20 years experience in the medical diagnostics industry. Chris said 'The combination of our proven product development and commercialisation expertise with the world-class intellectual property from the University of Birmingham will allow us to bring important new diagnostic products to market.'

Professor Lawrence Young, Pro-Vice-Chancellor and Head of College of Medical and Dental Sciences at the University of Birmingham, will sit on the board of directors for Biosciences Ventures and said 'The University of Birmingham has been exploring effective ways in which to unlock the potential of our intellectual property to enhance knowledge transfer activities and we are delighted to be partnering with Abingdon Health on this ambitious new venture.'

University of Birmingham spin-out companies

Learn more

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IQ booster



You can boost your organisation's knowledge and resources by tapping into world-class expertise at the University of Birmingham. We're constantly making exciting breakthroughs – in medicine and engineering, energy and social science – and then making them available to the people who will benefit most.

Here is just a snapshot of some of the technologies currently available from Alta Innovations, the University of Birmingham's trading and commercialisation company.

Technology and IP

Learn more

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Title	What is it?
Field Programmable Gate Array	An innovative new programming method for FPGAs
Word Dominoes	Linking phrases to enhance language learning with an iPhone app.
Plasmid Displacement	A powerful tool in research bacteriology
OmpD as Salmonella vaccine candidate	A new vaccine target has been discovered with the potential to provide the first effective vaccine against Non-Typhoidal Salmonella (NTS). This could bring relief to the hundreds of thousands of children and young adults who die each year from this bacterial infection.
EUCLID interferometer	When size really does matter. A compact laser interferometric measuring device capable of sensing at the pico metre level
A new genetic test for severe erosive Rheumatoid Arthritis	This predictive test can lead to early identification of the disease and therapy which may improve disease outcomes
Investment casting	Get set, go! A rapid production method for ceramic moulds used in investment casting
Epigenetic Comparison (CChIP assay)	A powerful new method of associating genes with proteins
Reconfigurable Antennae for Wireless Communications	A compact antenna for mobile devices, such as phones, laptops and PDAs that will operate across a range of bandwidths

**UNIVERSITY OF
BIRMINGHAM**

Edgbaston, Birmingham,
B15 2TT, United Kingdom

www.industry.bham.ac.uk

Research and Commercial Services

University of Birmingham

Edgbaston

Birmingham

B15 2SQ

Tel: +44 (0)121 414 3898

Fax: +44 (0)121 414 7151

businessteam@bham.ac.uk