

# GIBSON INDEX NEWSLETTER

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Your Monthly e-Newsletter on British Enterprise and Innovation

## Welcome to the UK's most comprehensive and best-read Newsletter on Small Technology Companies, Academic Enterprise and Latest Innovation

### Where are the next brilliant clusters emerging in the UK?

Some 10 years ago it was clear where the UK's leading technology **clusters** were based – they were centred around the hubs of **Oxford, Cambridge, Birmingham** and **Southampton**. How things have changed. Not only are there many more cluster locations sprouting in the UK, the diversity of the technologies displayed gets ever broader.

Today the **Bristol-Bath** cluster has grown to rival the quality of Cambridge in telecoms, software and many other sectors except biotech. Ten years ago Bristol University stood out as the best-rated institution with the worst – almost non-existent – track record in creating healthy, profitable spinouts. Not any more.

Secondly, the rapid emergence of **Tech City** in London took the LDA and other state agencies completely by surprise, especially as few ministers ever ventured further east of the Square Mile, and because it arose without a penny of state funding.

In 2014 we can now pinpoint hard-headed businesses rising in clusters all around the UK: oil & gas engineering SMEs in **Suffolk**, servicing the southern gas fields of the North Sea; plastics and composites firms around **Nottingham-Leicester**; biotech firms in **south Wales**; a renaissance of coal-related firms on **Tyneside** and, finally, a heady group of low-profile firms gloating over their success in the **Farnborough-Fleet** area of north **Hampshire**, bristling with companies in e-publishing, UAVs, finance software and HR software sectors.

Curiously, the one common factor is that state bodies have had almost nothing to do with their arrival – in spite of the billions spent on research by the UK Government and agencies such as the **TSB, EPSRC** and local enterprise partnerships.

This is because far too much R&D money is spent on 'R' and too little on 'D' in the UK, with the TSB having spent tens of millions on popular 'fads', such as energy and environmental technologies, and hideously unsuccessful **IT SME** support schemes, both of which have brought forth a mouse in terms of practical, commercial projects.

How much longer can this go on for? In the next few years we expect parliament and parliamentary committees to scrutinize the **TSB's** choices in particular – and wonder how on earth such errors could have been made.

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The Newsletter is compiled and edited by **Marcus Gibson**, former *Financial Times* technology correspondent, who has been covering enterprise and innovation for more than 20 years. The Newsletter aims to highlight developments in at least 100+ companies each month. It is derived from the wide-ranging news-gathering operation that produces the [Gibson Index SME database](#), which now contains profiles on more than 48,000 UK-based technology SMEs.

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## COMPANY OF THE MONTH

### Industrial Plastic Fabrications Ltd claim to be the UK's No.1 centre for 3D printing

They offer a range of 3D printing and rapid prototyping services to a wide range of industries as well as model makers and product designers, said head of rapid prototyping **Gary Miller**. IPF were the first in the U.K. to offer the Polyjet system as a bureau service and use the latest Objet Connex 500 and Objet Eden Polyjet 350V 3D printing machines, providing fast and flexible high quality rapid prototyping solutions.

The **Waltham Abbey**, Essex-based firm also deploys a Perfactory Envisiontec machine to produce small but incredibly detailed and accurate parts. It offers high quality machined, formed and fabricated plastic components, plus rapid prototyped parts and 3D printing to the very best standard in the industry.

Established in 1969 **Industrial Plastic Fabrications** have over 40 years worth of experience, especially among its team of expert machinists, who can create the tiniest of parts right up to 3050 x 2030mm parts in one pass. Located just north of London, UK, the company employs 12 members of staff; with two full-time and one part-time staff working in the rapid prototyping department.

Rapid prototyping is offered in a wide range of shore hardnesses and finishes create precision machined, fabricated or formed components provide crucial parts for equipment used within the pharmaceutical, medical, aerospace, automobile, security, audio and broadcasting industries – in short our capabilities are wide and far reaching – we've even made a huge Perspex bed for a James Bond film.

**Contact:** [www.ipfl.co.uk](http://www.ipfl.co.uk)

## SME NEWS – ENGINEERING, CONSTRUCTION & ENERGY

### RAENG's first Launchpad Competition Final attracts high quality entries

The Launchpad Competition is aimed at budding young technology entrepreneurs in the UK between the ages of 16-25. The winner will receive the **JC Gammon Award** – a £15,000 prize and bespoke support including mentoring from Academy Fellows, business leaders and investors.

The three finalists are **Dr Niall Kent**, co-founder of **Aerograft** – producer of a novel material for bone grafting in dentistry; **James Popper**, founder at **Sinclair Fire** – rapid fire detection using an innovative infrared flame detection technology; and **Hind Kraytem**, co-founder and CEO of **Radial Genomics Ltd** – improving cancer patients' quality of life through a more accurate, quicker and minimal invasive technology.

On the day the winner was Dr Kent's Aerograft, who won an award for developing a synthetic bone replacement that can be used in dental procedures. Dr Kent, a post-doctoral researcher at **UCL**, won £15,000 to expand his start-up, which he founded with **Dr Alessia D'Onofrio**. At the moment, when a patient needs an implant or is missing part of their jaw, dentists have to use synthetic bone replacements or real bone from a donor cadaver. Aerograft is a more sophisticated alternative to both and is especially innovative given that there's apparently been little progress in this field for decades.

James Popper's Sinclair Kitchen Fire Detector uses infrared technology to detect blazes quickly, and was inspired after a family friend with dementia suffered significant fire damage to her home. The finalists will all now become members of the Royal Academy of Engineering's **Enterprise Hub**.

**Contact:** [www.raeng.org.uk](http://www.raeng.org.uk)

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## Electric cars firm Sevcon signs deal with Chinese auto supplier Risenbo Tech

**Matt Boyle**, chief executive of Sevcon, said the Gateshead-based business had agreed a contract with **Risenbo Technology Co Ltd**, a subsidiary of a Chinese Tier 1 automotive supplier based in **Hubei Province**, having recently been given the required approval of the government authorities in **China**.

Electric vehicle firm Sevcon launched the joint venture in a bid to secure a significant share of the rapidly-growing Chinese market. Operating as **Sevcon New Energy Technology Company Ltd**, the new firm – in which Sevcon and Risenbo each will own a 50 per cent stake – will source from Sevcon and market and sell existing and future Sevcon products for on-road electric and hybrid vehicle applications.

The company, which employs 115 people, also produced pre-tax profits of £435,000, compared with a loss of £730,000 in the corresponding period, and said the lift for the three months to December 31 reflects improving conditions in its markets.

Mr Boyle said: “Sevcon’s revenue growth in the first quarter was driven by increased product shipments in the majority of our markets, and in all three of the geographic regions we serve. Our sales growth in **North America** was driven by substantially stronger demand, year-over-year, in our traditional off-road markets, primarily for fork-lift truck and aerial work platform applications.

“Demand also was significantly higher in **Japan** and **China**, primarily for off-road applications as well. Although the European economy still faces challenges, this was our second consecutive quarter of growth in that region. Partnering with Risenbo is a unique strategic opportunity for Sevcon to gain greater access to the world’s largest electric and hybrid vehicle market.

**Contact:** [www.sevcon.com](http://www.sevcon.com)

## Glasgow’s Star Refrigeration Ltd wins key award for district heat pump project

The UK team responsible for the world’s largest ‘zero carbon’ district heat pump scheme was awarded the **Rittinger Award** by the **International Energy Agency**.

The 90°C (194°F) ammonia-driven system has been installed in Scandinavia but designed and manufactured in Glasgow by **Star Refrigeration Ltd**. The company’s **Dr Andrew Pearson** received the award for his ground breaking research, design and development work in the field of heat pump technology. His pioneering technology has made it possible to deliver heat at high temperatures using ammonia, a ‘non-ozone depleting’ refrigerant with zero GWP, to run the system.

Their ground breaking projects include an Ammonia District Heat Pump installed in **Norway** – that was included in Emerson’s “*It’s Never Been Done*” series. The plant used the freezing waters of the North Sea as a renewable source to provide heating and hot water for the 60,000 people living in **Drammen’s** homes and businesses.

The industrial water heat pump design allowed an energy efficiency increase of 25 per cent, in comparison to conventional commercial heat pumps. It also enabled the use of renewable energy – hydroelectricity-ensuring the heat pump makes ‘zero carbon heat’ available from a fjord.

The award is named after **Peter Ritter von Rittinger**, an Austrian engineer credited with the design and installation of the first practical heat pump system in 1856. It is estimated that Star’s industrial heat pump can generate enough heating for 6,000 homes, and save £1,500pa per household for 20 years if installed in the UK.

**Contact:** [www.star-ref.com](http://www.star-ref.com)

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## Complex Cold Forming secures a £1.2 million funding package from HSBC

**Birmingham**-based automotive components company Complex Cold Forming has won a £1.2 million funding package from HSBC to help drive its growth plans on the back of contract wins with global car manufacturers.

The company works with many global automotive companies, as well as companies in oil and gas, shipbuilding and rail. It recently won contracts with **Ford** in the US and Europe and plans to seal further deals with automotive firms over the next 12 months.

The company has been investing in plant and machinery on the back of the growth of the business and the latest investment is a six station cold forging machine, which will be the most capable machine of its type in the UK.

This complements seven new CNC machines recently added, which help to refine the initial components produced during the cold forming process. Cold forming is an efficient manufacturing process for the company's products, due to its speed, accuracy and limited material waste.

The MD **Robert Smith** said: "This latest investment will enable us to produce larger, more complex components, help us to fulfil new contracts and expand further into different market sectors."

Technical Director **Paul Bailey** said: "Thanks to **HSBC** we have been able to invest in equipment needed to ensure we can continue to offer the latest design ideas to our customers and through this we have secured over £4 million worth of future business for innovative projects."

Complex Cold Forming's history dates back to the 1920s, but it was acquired by its current management team in 2009. Based at a 45,000 sq ft site in Wednesbury, the company employs 40 people, a number which has more than doubled since 2009. The company expects to create a further 15 new jobs over the next three years.

**Contact:** [www.complexcoldforming.com](http://www.complexcoldforming.com)

## StadiArena Ltd's concept helps fill stadia that would otherwise be empty

With stadia often empty for up to 340 days of the year, the firm has revolutionised the way new and existing stadia and stands are built. **Paul Fletcher MBE** designed and patented the StadiArena concept between 2005-2007. StadiArena now provides that vital income that will keep these buildings profitable.

An outdoor stadium can be converted to an indoor arena in 20 minutes. **StadiArena** was launched in July 2007. Based in **Meriden, Coventry** within weeks the business had expanded with offices in **London, New York, Sydney, Dubai, Cape Town, Moscow** and **Beijing**. The speedy expansion was due to the input of **Patric Cassidy** of the **Cassidy Group** who invested in StadiArena within a week of seeing the concept. The Cassidy Group are now 50 per cent shareholders in StadiArena and with partners Paul Fletcher MBE, **Ken Sharp** and **Mal Brannigan** are keen to establish the concept worldwide over the next 5-10 years.

When building stadiums for **World Cups** or **European Championships** governments now concentrate their efforts on what 'legacy' the stadium will leave behind for the community once the event is over. The stadiums – seat, pitch and concourses – of the last decade have been built with a 50-year lifespan and will be used for one year out of the 50 years – lying idle for 49 years. StadiArena will help to revolutionise the way stadiums are designed and built over the next decade and leave a lasting legacy.

**Contact:** [www.stadiarena.com](http://www.stadiarena.com)

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## UK-developed portable scanning device field tested at 2014 FIFA World Cup

**Radio Physics Solutions Ltd**, the company behind the commercialisation of the scanning device, understood that millimetre waves have been used to harmlessly x-ray trucks for years but has always been a prohibitively expensive technology (upwards of \$500,000 per device) that was non-portable.

Their device works by firing a wave of radio beams at two different frequencies and then having an AI system to read the reflections to determine the presence of different types of objects, even if concealed. By running many different objects through the scanner, RPS has built up a significant database that means there are now very few false or unknown readings in testing. Best of all, the scanners can detect composite, non-metallic weapons.

RPS, along with the **Manchester Metropolitan University**, has been able to 'miniaturise' the technology and produce it at an affordable price. The company took over a former UK **Metropolitan Police** project that came about after the **Jean Charles de Menezes** incident but was later mothballed due to lack of funding. The Met is still heavily involved in the project and has supplied a diverse series of weaponry to be scanned – from gun-powder muskets to bomb vests like those worn on the 7/7 terrorist attacks in London

Business manager **Carl Cagliarini**, of Radio Physics Solutions, said its bomb and weapon scanners are the first in the world able to detect even 3D printed guns and weapons.

Earlier, the company raised £700,000 on the Cambridge crowdfunding platform **SyndicateRoom**. **Lord Douglas Dundonald**, chairman of RPS, added: "We are delighted to have successfully raised capital on the SyndicateRoom platform and to have comfortably exceeded our funding target. I'm now looking forward to welcoming new members to RPS who have an interest in supporting a highly disruptive British technology company in bringing life-saving equipment to market."

In a recent test for **NABIS, the UK's National Ballistics Intelligence Service**, the firm's technology took less than a second to detect a concealed plastic gun made on a 3D printer. It was able to detect the potentially deadly weapon at a range of up to 25 metres.

The detector is the latest in a series of sophisticated products designed by the company to save lives at transport hubs. Its goal is to counter the threat posed by firearms as well as personally-carried suicide bombs.

The company, which specialises in imaging devices that use extremely high frequency radio waves to 'see' through obstacles and clothing, also makes radar equipment for aircraft which will allow pilots to fly safely through fog, dust and smoke.

**Contact:** [www.radiophysicssolutions.com](http://www.radiophysicssolutions.com)

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## SME NEWS – ELECTRONICS & TELECOMS

### **Crimson Tide plc signs three year contract worth at least £250,000**

Based in Tunbridge Wells the mobile technology developer signed a contract with one of the world's largest food companies worth at least £250,000 over three years.

Crimson Tide said the value of the deal with the unnamed chain could rise significantly as its smartphone and tablet apps are rolled out worldwide. The company's **mpro5 system** – a cloud-based software which help businesses schedule deliveries and the like – will provide services like proof of delivery and estimated time of arrival for the food firm's clients. It is expected to be rolled out to thousands of users through the deal, transferring data between mobile devices used by drivers and delivery workers. The system will come into use in Australia first, with further countries to follow suit.

Crimson Tide is providing local language versions of mpro5 and its mpro cloud-based management website, hosted on Microsoft Azure.

Chairman **Barrie Whipp** said: "This contract is a transformational landmark for Crimson Tide. The mpro5 software allows clients to track deliveries and find out expected arrival times. It validates mpro5 as a world leading enterprise cross platform mobility solution. I was particularly pleased that Microsoft introduced the two companies based on Crimson Tide's experience in delivering enterprise mobility in the cloud on Microsoft Azure. Our footprint will expand worldwide and we are very proud to be working with our global client on this project."

Crimson Tide was founded in 1996 and listed on the London Stock Exchange in 2006. It launched its mpro applications in 2004. The mobile business systems have since become the focus of the business

**Contact:** [www.crimsontide.co.uk](http://www.crimsontide.co.uk)

### **Drayson Wireless Ltd formed to commercialise wireless energy technology**

Developed at **Imperial College London**, and working closely with **Imperial Innovations plc**, Drayson Wireless will bring the technology to market in numerous applications and sectors. The business is based upon world-class research conducted over several years by scientists from the **Department of Electrical & Electronic Engineering** at Imperial College. The Imperial team is led by **Dr Paul Mitcheson, Dr Stepan Lucyszyn** and **Dr David Yates**. In particular PhD research by **Dr Manuel Pinuela** is central to the venture and as such Dr Pinuela becomes CTO.

Former Labour minister and successful Oxford biotech entrepreneur **Lord Drayson**, chairman of Drayson Technologies said: "Over recent years we have seen a revolution in the way wireless technology has transformed communications, making smartphones and social media part of our everyday lives. The same is about to happen to energy and Drayson Wireless aims to be at the centre of this next revolution."

In addition, Lord Drayson has brought together an experienced team with senior-level experience from companies such as **Qualcomm, PowderJect** and **Circassia**, with backgrounds in building global businesses in wireless technology and life sciences.

The new business builds upon Drayson Technologies' expertise in the use of wireless power in automotive applications such as the development of the **Drayson B12/69** wirelessly-charged electric race-car that set a new **FIA World Electric Land Speed Record** in 2013.

**Contact:** [www.draysonwireless.com](http://www.draysonwireless.com)

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## Hereford's Global RadioData Communications wins significant contract

Global RadioData Communications (GRC) Ltd, based at **Wyevale Business Park**, is supplying communications equipment to armed forces in the Lebanon as part of an overall £10m UK backed project securing **Lebanon's** borders with **Syria**.

A range of new equipment is being delivered to Lebanon's land border regiments including secure HF & VHF radios, and GRC is supplying the secure, fixed and mobile communications capabilities.

GRC MD **Iain Pope** said the company's involvement with the project coincides with a period of employment & business growth. "We are very much looking forward to promising 2014 business year," he said.

In 2012 GRC introduced **Scytale Lite** – GRC's recently developed Lite version of Scytale includes 2 ethernet ports, 2 VoIP ports and a private GSM Picocell packed into a ruggedised backpack weighing less than 10kgs, and it earlier demonstrated it at the **DVD show** at the **Millbrook** showground.

**Contact:** [www.grcltd.net](http://www.grcltd.net)

## SME NEWS – CHEMICALS, MATERIALS & ENVIRONMENT

### Hampshire-based PyroPure develops micro-scale waste-to-energy pyrolysis tech

Designed for on-site waste disposal, PyroPure's technology is expected to reduce the cost, environmental impact and hazards associated with traditional disposal practices.

The company added that its system uses pyrolysis, a thermochemical decomposition process using high temperatures and an absence of oxygen to destroy all non-recyclable waste.

The technology is said to enable the on-site destruction of waste, which negates the need for waste to be stored on-site for any length of time, collected and then transported long distances before being destroyed.

Earlier the firm was awarded over £165,000 in **Smart Award** funding from the UK's innovation agency, the **Technology Strategy Board**. It will help PyroPure develop and pilot its solution for the disposal of hypodermic syringes and other medical sharps.

**Peter Selkirk**, chairman of PyroPure, said "This backing provides us with the assurance and official recognition that PyroPure has the potential to completely reshape the current model for waste collection within hazardous environments, where waste is expensive to dispose of and where its collection bears a degree of risk.

"Whilst pyrolysis isn't new, the ability to harness its power within one small machine is," he added. In a global market for medical sharps waste that is estimated to be worth £600 million PyroPure said that it is now only months away from making its technology commercially available.

The company said that it expects the system to become a major component of the hazardous waste-handling infrastructure and play a key role in reducing infection levels typically caused through the mishandling of hazardous materials.

It is also claimed to dramatically decrease the cradle-to-grave trail of hazardous waste by reducing the number of touch points typically required by those traditionally responsible for manually handling it.

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In addition to reducing disposal and collection costs, the company added that its technology also enables the efficient recovery of metals for recycling and energy from hazardous waste.

The energy is recovered in the form of heat, and can then be redistributed within the building in which the PyroPure system is located via the hot water system.

**Contact:** [www.pyropure.co.uk](http://www.pyropure.co.uk)

### **Recycling Technologies manufactures machines that convert waste plastic to oil**

In October 2014 Recycling Technologies received an investment from a London-based specialist fund. The firm, which is building a pilot plant in Swindon to demonstrate its pioneering process, will use the funding to help market its machines. It is already in advanced discussions with a large number of potential customers and industry partners in the UK and abroad.

Recycling Technologies was spun out from the **University of Warwick** in 2011. In 2013 it opened its research and development and production facilities in Swindon to develop and manufacture its patented modular recycling system.

The machines convert mixed plastic waste (MPW) which usually goes for landfill or incineration into **PlaxOil**, a clean heavy fuel oil (HFO) alternative that can be sold or used as a fuel in localised on-demand CHP (combined heat and power) plants.

The units are capable of processing up to 7,000 tonnes of waste a year.

Unlike other waste streams such as glass, paper and separated plastics such as PET and HDPE most MPW is currently not recycled. Around 30m tonnes of plastic waste goes to landfill or incineration in the EU every year simply because it is mixed.

The funding – details of which have not been disclosed – comes from **EcoMachines Incubator**, a seed fund and accelerator for start-ups in the energy and resources. EcoMachines CEO **Ilian Iliev** said: “We have chosen to support Recycling Technologies because they provide an innovative and practical solution to the world’s pressing plastic waste problem. Plastic is one of humanity’s most useful inventions, yet plastic waste is one of today’s major environmental pollution problems. At a time of flux in the waste industry, the company’s team impressed us with their vision and growth ambitions. We are excited that Recycling Technologies are joining our Accelerator programme.”

Recycling Technologies founder and MD **Adrian Griffiths** said: “EcoMachines’ investment and support will help the company to accelerate, bringing this exciting technology to the market quickly.” EcoMachines was joined in the investment round by business angels with professional experience in the energy and waste industry.

**Contact:** [www.recyclingtechnologies.co.uk](http://www.recyclingtechnologies.co.uk)

### **Innovation Birmingham’s Low Carbon Accelerator programme picks nine startups**

The senior project manager for EU Projects Katharine Fuller at Innovation Birmingham said the £100,000 of initial investment cash is being shared across nine start-ups on Innovation Birmingham’s Low Carbon Accelerator programme, which is part of the European-funded Climate-KIC initiative.

The nine low carbon start-ups being awarded grant funding are: Full Grown, which is working to change wasteful mass production processes; 5L, a water and energy efficiency business; Unicorn Power Ltd, specialising in clean energy and environmental mitigation; Libralato, a hybrid powertrain specialist;

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Alkali Solutions, which specialises in industrial symbiosis; WRK Design & Services Ltd, an alternative energy provider; Petalite Battery, which reduces carbon in manufacturing and the product lifecycle; Greengineering Ltd, which specialises in resource and built environment efficiency; and Civico Online Exchange Tracker, a waste prevention solution.

A total of 16 low carbon start-ups pitched for the investment funding, in front of a panel of three industry judges. The process was facilitated by Innovation Birmingham's Climate-KIC team and two of the Entrepreneurs in Residence.

Katharine Fuller said: "Early stage grant funding makes such a difference to start-up businesses. The timetable required for an entrepreneur to launch their product or service to market is critical, and the funding available through the European Climate-KIC initiative enables the best businesses starting up in the low carbon sector to receive a helpful grant.

In addition, Innovation Birmingham Campus hosted a heat of the 'CleanLaunchpad' competition in which the eventual winners and two runners up will collectively receive £13,600 (€17,500) to develop clean-tech products and services.

The competition is one of the initiatives being run by Innovation Birmingham's Climate-KIC team. Cambridge-based bio-glue manufacturer Cambond was named the overall winner of CleanLaunchpad UK. The company makes adhesives from biomass feedstocks including algae using a low-carbon, cost-effective process.

It will now progress to the European-wide final in Valencia at the end of October where it will be joined by the UK joint runners-up. Derby-based Adaptavate has developed a natural compostable plasterboard, suitable for use on heritage buildings and traditional homes, while London company Desolenator has produced a solar-powered means of desalinating water.

**Contact:** [www.innovationbham.com](http://www.innovationbham.com)

### **Monitor Coatings awarded deal to supply deck surface for big Royal Navy carriers**

After a two-year test programme, **Monitor Coatings Ltd** have been awarded the contract for providing a non-skid, thermal gas wash resistant deck coating for *HMS Queen Elizabeth* and *HMS Prince of Wales* carrier decks, both UK vessels of the **Royal Navy**. With a flight deck the size of three football pitches (19,500m<sup>2</sup>) and taller than Niagara Falls (56 meters), HMS Queen Elizabeth is the largest ever built for the Royal Navy.

In 2012 **Aircraft Carrier Alliance** asked Monitor Coatings Ltd to investigate and deliver a suitable deck coating that would withstand the aero-thermal environment and gas wash exhaust of the F35 engine on JSF and Eurofighter when conducting a hover transition and vertical landing.

The activities included the development of techniques required for large scale preparation and application of a **Thermal Metal Spray System** (TMS) over an area in excess of 19,500m<sup>2</sup>, the development of process-technology readiness and manufacturing capability levels acceptable for large scale application and long term support for the two carrier decks. The scope of work culminated in a two day demonstration of the process application, quality system and in-service repair program of the decking.

Monitor Coatings Ltd has been part of **Castolin Eutectic** since April 2013 and provides world-class wear protection services for aerospace, oil & gas, steel and many other industries. Monitor Coatings Group has facilities in the UK, Singapore and China.

**Contact:** [www.monitorcoatings.co.uk](http://www.monitorcoatings.co.uk)

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## Graphene maker G-Heat Ltd received investment from AIM-listed Cientifica plc

G-Heat's proprietary graphene-based technology allows the production of heaters that use up to 70 per cent less energy than conventional systems while maintaining the same comfort levels. It therefore promises to change the electrical heating market, both commercial and domestic, in the same way that the introduction of LEDs revolutionised lighting.

G-Heat's Graphene **Thin Film Comfort Heating** takes heating into the networked 21st century. Its instant on and off capability means that it is ideally suited to and fully compatible with all current smart thermostats. The G-Heat systems can also be easily integrated with home automation API's such as **Apple's** HomeKit and **Google's** NEST, which have already been adopted by companies such as **Mercedes-Benz, Jawbone, Logitech, Whirlpool** and **IFTTT**.

**Contact:** [www.g-heat.com](http://www.g-heat.com)

## SME NEWS – BIOTECH, PHARMA & MEDICAL SCIENCES

### Monster \$104 million deal puts Adaptimmune Ltd on path to early glory

Did I read that figure correctly? A Series A financing round worth \$104 million has been signed by leading anti-cancer firm **Adaptimmune**, which is focused on the use of T-cell therapy to treat cancer and infectious disease. Some highly regarded biotechnology investment groups in the US, led by **New Enterprise Associates** (NEA) and **OrbiMed**, are involved.

Adaptimmune plans to use the proceeds to advance the company's internal programmes into the clinic in multiple cancer indications.

Adaptimmune has also been selected by **FierceBiotech** as one of the 'Fierce 15', the top 15 private biotech companies of 2014 globally.

New investors included **Wellington Management Company, LLP, Fidelity Biosciences, Foresite Capital Management, Ridgeback Capital Management, Novo A/S, QVT, Rock Springs Capital, venBio Select** and **Merlin Nexus**.

Using its unique T-cell receptor (TCR) engineering technology, Adaptimmune has created TCRs which are deployed to target the cancer testis antigen, NY-ESO-1, as well as other targets.

In June the company announced that it had entered into a strategic collaboration and licensing agreement with **GlaxoSmithKline** covering an option on the NY-ESO-1 clinical programme. Adaptimmune is currently running trials across the US in multiple myeloma, melanoma, sarcoma and ovarian cancer.

**Contact:** [www.adaptimmune.com](http://www.adaptimmune.com) – James Noble, CEO.

### The robotic legs made by Rex are giving wheelchair users the chance to walk

In 2014 the firm raised £10m in an AIM float as it reversed into an investment shell named **Union Medtech**. The latter is run by veteran biotech investor **Jeremy Curnock Cook**, who set it up after gaining £177m from the sale of **Biocompatibles plc** to **BTG** a few years ago. Rex is now valued at £25m by market value. It is in the process of recruiting sales teams in the US, where the firm is first being concentrated.

The model sold to health centres, **Rex Rehab**, can be adjusted to suit users of various sizes. The price tag

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is £95,000. With automation and future innovations in manufacturing Curnock Cook believes his legs will make it a suitable alternative to a wheelchair, attracting the attention of the big US healthcare market. The benefits to wheelchair users of spending time in an upright position are well documented.

The legs will be trialled and tested at a **US military** rehab centre, and similar trials are planned in Britain. For example, the number of care staff required to help users of the robot legs compared with a patient using a standing frame is many fewer as the former is much more stable.

Almost fully encasing the bottom half, they hold the legs in place while they walk from place to place, controlled by a small joystick at waist height. British inventor **Richard Little** said the inspiration behind these techno trousers did not draw his inspiration from the film of the plasticine pair '*Wallace and Gromit*', but his best friend who suffered from debilitating multiple sclerosis 10 years ago. He said "The pair of legs have 29 processors in it, sending around 3,000 messages a second," Just 13 pairs have been sold so far and the business was based in Little's garage in **Auckland**.

**Contact:** [www.rexbionics.com](http://www.rexbionics.com)

### **Aesica Pharmaceuticals sold to Consort Medical plc for £230m**

**Robert Hardy**, CEO of Northumberland pharmaceutical firm **Aesica Pharmaceuticals** marked its 10th anniversary by unveiling a 10 fold increase in its workforce and turnover over the last decade.

Dr Robert Hardy had led the 2004 management buyout of **BASF's** production facility in Cramlington to create Aesica Pharmaceuticals, which started out with 130 staff. Employees had risen to 1,300 across its six development and manufacturing sites in the UK, Germany and Italy, having taken on new staff at a second manufacturing facility in Kent. Dr Hardy opened the operation, in **Queenborough, Sheppey**, a year ago, expansion which has helped to bolster sales by more than £30m over the last 12 months.

First year sales at Aesica were £25m in 2004, but grew to £163.2m in 2012 and are expected to reach £200m when latest accounts are posted at Companies House next month.

In late September the board of Aesica announced the sale of the firm to **Consort Medical plc**, a UK firm that is developing and manufacturing disposable medical devices for drug delivery including inhaled, nasal and injectables products through its core operating division **Bespak**.

**Jon Glenn**, Consort Medical plc's CEO said: "The acquisition of Aesica represents a strong fit with our existing strategy of diversifying into adjacent markets and technologies to capture additional value in the drug/device supply chain. As one of Europe's leading pharmaceutical CDMOs, Aesica is highly complementary to Bespak's existing business and provides a number of clear strategic, competitive and value-enhancing benefits for the enlarged group."

**Contact:** [www.consortmedical.com](http://www.consortmedical.com)

### **Edible thin films has proved highly profitable to Glasgow-based BioFilm Ltd**

Founded in 2003 as a subsidiary of **Devro plc**, **BioFilm** is the largest thin dissolving film (TDF) producer in Europe, with their GMP certified manufacturing and packaging facility located at the company headquarters near **Glasgow**, Scotland. BioFilm has established an excellent reputation for developing and manufacturing TDFs that incorporate active ingredients into unique dosage forms for delivery of dietary supplements, cosmetics, oral hygiene products and **OTC drugs**.

In addition to offering teeth whitening strips available for branded use, BioFilm offers numerous fully developed thin film products for both private label and branded use including dry mouth strips, caffeine

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strips, melatonin strips, and films for skin lightening and the treatment of age spots and melasmas.

BioFilm provides a 'one stop' shop, offering concept to product development, manufacturing, packaging and final retail delivery. In September 2014 BioFilm agreed a partnership with US firm **Health and Beauty Aid (HBA)** to represent BioFilm in North America.

Earlier this year BioFilm also signed an agreement with **Technology Commercialization Group, LLC** (TCG), a life sciences business development firm in Research Triangle Park, **North Carolina**, to grow its North American business.

**Contact:** [www.biofilmgroup.com](http://www.biofilmgroup.com)

### **Hart Biologicals plans £650,000 spend on new equipment in Hartlepool plant**

The firm, based on the **Queens Meadow Business Park**, is ploughing £150,000 into new equipment as well as spending £500,000 on buying the building it currently leases.

The success of the firm, which makes biological reagents used to investigate blood clotting disorders, is down to its expertise in a niche market. MD **Alby Pattison** said: "Our contracts with our major company in **Germany** are growing significantly to the point where we have set up **Hart Innovations** which is a company within Hart Biologicals but it deals with research and development."

The new firm will look at the management of bleeding in trauma and surgical fields.

Mr Pattison said: "We are building two more labs and have just commissioned a new production line and that is to support a project with the German company. It will simplify the testing process tremendously and that should significantly improve hospital access to the machinery."

Hart Biologicals is also a key partner in a project which will develop a new blood analysis process – and that means the need to invest £150,000 in new manufacturing systems at the company's Hartlepool headquarters. Hart Biologicals has markets mainly in Germany, other parts of Europe and the USA, but potential markets were opening up in **Asia, Russia** and **Brazil**.

**Contact:** [www.hartbio.co.uk](http://www.hartbio.co.uk)

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### **Accenture buys enterprise performance management company PureApps**

PureApps' technology helps clients use financial insight and analysis to improve organisational effectiveness through better cost management. Accenture says the acquisition will strengthen its end-to-end EPM capabilities and help CFOs transform the finance function through the use of emerging digital technologies.

PureApps MD Nick Wyatt said the firm's technology enables CFOs to report and analyse enterprise performance, accurately forecast business results and work with business units to transform these insights into action.

The company will be integrated into Accenture's Finance and Enterprise Performance practice, part of Accenture Strategy. Chris Wright, MD, Finance and Enterprise Performance practice at Accenture Strategy, UK and Ireland said "EPM is experiencing strong growth, driven by the demands of CFOs who are being asked to play a more central role in enhancing the organisational agility of businesses in response to rapidly changing markets.

"Success depends on being able to turn strategy into execution more effectively and comprehensive performance management capabilities are critical to achieving that. The combination of Accenture and PureApps's EPM capabilities demonstrate the value to CFOs of integrating business, technology and function strategies within organisations," Wright said.

**Contact:** [www.pureapps.com](http://www.pureapps.com)

### **'Tech alchemist' firm Engage Production launches its Flux Innovation Lounge**

Engage Production Ltd designs and produces experiential technology concepts for its clients, with a view to driving brand engagement. It has worked with a multitude of high-profile organizations, such as Bloomberg, Sky, Ferrari, Nike and Visa to name but a handful.

The firm uses a mixture of technologies and works with partners to meet the briefs that it receives. The launch of its Flux Innovation lounge showcases some of the work that the company has produced.

Most prevalent amongst the technology on show were MultiTaction's (formerly MultiTouch) 55-inch ultra-thin bezel displays. The screens are Full HD and offer fast response multi-touch functionality. They can be stacked, used flat as interactive table-tops, and joined together to create super-sized displays.

Indeed, the most dramatic exhibit on display was MultiTaction's iWall – a 5 x 2.5 m (16.4 x 18 ft) interactive wall made up of 12 of the MultiTaction displays. Engage previously used the iWall as part a project to create an immersive business workspace. It provides users with the capability for unlimited simultaneous touch, infra-red pen input and object recognition. Visitors can expect 18-foot (5.5m) touchscreens, holographic cabinets and immersive environments.

Other highlights at the Innovation Lounge include Space3D's holographic signage, which although not new technology, still impresses with its vivid animated holograms, and 7th Sense's Totem Paul sculpture – a small-scale example of its 3D projection mapping capabilities. An Oculus Rift is on display running a virtual reality scuba diving simulation, and visitors can also see a Double Robotics telepresence robot in the flesh.

**Contact:** [www.engageproduction.com](http://www.engageproduction.com)

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## Sleepy Cirencester boasts 5th largest money comparison site – Dot Zinc Ltd

**Dot Zinc Ltd** runs Money.co.uk, though many people have never heard of them. Yet **Money.co.uk** receives more visitors per month than the popular and well-known comparison site **Confused.com**.

MD of Money.co.uk, **Chris Morling**, said that the company, which only has 30 members of staff, had got to this impressive stage without any real advertising. But now he believes the time has come to start becoming a household name.

He said “Our increase in traffic is predominantly through online marketing and we have got to an incredible position. More than 23 million people have used our service already this year but many would not be able to differentiate us from our competitors, an issue we plan to address.”

The firm will be releasing the advert across 36 different TV channels in less than two weeks but Chris has said they will be going for a subtle advertising approach. He added “There will be no funny animals or people singing. It will be a very simple, stylish advert.”

The business is facing a radical overhaul, including a major re-brand and website design alongside the launch of its first advertising campaign, just in time for its sixth birthday.

**Recommended by Money.co.uk** attracts near to 2.5 million visitors every month, and despite not being well-known, the company is up in the top five largest comparison sites in the UK, along with the opera-singing **Go Compare** and the meerkat-loving **Compare the Market**.

The business’s mission is to offer people the simplest and most useful service in the sector. Already the firm has added a range of tools which will make financial comparison even easier for potential customers to find their way around. Staff have ambitious plans for growth and aim to increase traffic by 40 per cent in the next year.

**Contact:** [www.money.co.uk](http://www.money.co.uk)

## Software services firm Tracsis plc buys Datasys Ltd for £4.5 million

Manchester-based rail management software systems business **Datasys** has a client base which includes **National Express Group plc** and **Stagecoach Group plc**. The main activity of Datasys is software development, sales and licensing, with revenues predominantly derived from products that assist train operators capture, report and analyse the root causes of delays and other performance-critical information. **Tracsis** said the vast majority of Datasys revenue comes from long-term recurring software leases. For the year ended May 31, Datasys generated pretax profit of £298,000 and revenue of £2.3 million. The business is currently debt free and has cash balances of around £1.3 million.

In the **GI** database it is recorded that Datasys won a **TSB Smart Award** in 2011-13 for the development of a prototype in Round 4 September 2012. The project was for a ‘Contextually Aware Mobile Application to revolutionise attribution in the UK rail industry’. The firm has more than 17 years experience of designing and implementing complex rail management systems that underpin the business activities of 21 of the UK’s train operating companies.

Datasys’s software enables availability of accurate and reliable information, helping customers deliver improved performance and profitability. In 2013, during a recent visit to **London Midland**, the Datasys **Bugle V4** and **Acumen BI** were observed in action.

**Contact:** [www.datasys.com](http://www.datasys.com)

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### 3D Industries Ltd wins funding from the TSB and angel investors

In mid-2014 3DI launched a new search engine called **3Dshap.es** that surveys 3D content on the web by shape. 3Dshap.es uses drag-and-drop functionality to let users upload 3D models of shapes similar to those they are searching for to 3D print. The company was founded in 2013 and already has a list of 3D clients and partners including **Shapeways.com**, **3DLT.com**, **Proto3000.com**, and **Cadenas**, which has the largest industrial 3D catalogue firm.

3D content is growing dramatically. The market is expected to continue to grow by 23 per cent from 2013 to 2020, reaching \$8.41 billion in 2020 according to a report by **MarketsandMarkets**. According to the same report, Europe is poised to pass the Americas in terms of revenue in 3D printing by 2020. With this fast growth rate, 3D search will become one of the only ways to manage and navigate the 3D content landscape on the web.

Founder of 3D Industries is **Seena Rejal**. He said “Without management of 3D on the web, 3D printing content will become unmanageable very soon and will be a barrier to growth in the 3D printing sector. There has been brilliant progress in development of hardware in the sector, but content creation, access and protection have been an afterthought.”

Rejal says easy access to 3D shapes for printing is also the way to expand 3D printing beyond the specialists and enthusiasts to a more global audience. “This is when true democratization of this movement really happens,” added Rejal.

Every new market has its growing pains. Look at the emergence of downloadable music. From Napster that paved the way for **iTunes** to **Spotify** and recently **Google Music** to where we are now – paid content that’s tracked and protected. The 3D printing market is experiencing the same, significant amounts of 3D content with little or no tracking.

**Contact:** [www.3dindustries.co.uk](http://www.3dindustries.co.uk)

### Location firm Ubisense sees 40 per cent surge in revenues and reports bulging order books

A smiling CEO **Richard Green** is particular pleased with the level of solutions-based sales as Ubisense transitions its business model. He said the group also had a strong balance sheet and was cashing in on a strategic acquisition in Japan which had broadened the company’s business base in Asia.

A trading update for the half-year to June 30 shows what Green calls “substantial progress with its transition towards a solutions-focused business model during the first half.”

Ubisense adds that traction with its **Smart Factory System** and **MyWorld** products had been evidenced by “the considerable number of new customer wins and extensions signed in the period, helping to deliver a c.45 per cent increase in solutions revenue compared to the same period last year.”

Strong customer momentum has helped Ubisense achieve revenues of around £17m – 40 per cent up on the prior year – plus a closing order book at June 30 of £16m. “As a result the group is confident it is on track to deliver results in line with the board’s expectations,” it told shareholders. Notable new solutions customers in the period included **Audi**, **General Motors**, **Duke Energy** and **Central Hudson**.

Ubisense said its Asia-based acquisition, **Geoplan Group**, continued to make strong progress winning a number of early stage deployments of Smart Factory System and myWorld with major strategic customers in Japan and Korea including **Toyota**, **Hyundai**, **KEPCO** and **NTT**.

**Contact:** [www.ubisense.net](http://www.ubisense.net)

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## Smart421 completes transfer of rail industry's £2bn ticket business to the cloud

The Ipswich-based systems integration specialist Smart421, which secured the contract in November 2012 and began development work the following month, will now provide a round-the-clock seven-day-a-week support service for the next five years.

The Live Sales Management (LSM) platform which underpins the online sale of rail tickets and their collection from self-service ticket machines, is operated by **Rail Settlement Plan (RSP)**, a company jointly owned by the UK's franchised passenger train operators.

**Neil Miles**, MD at Smart421, said that, in responding to RSP's requirements for a flexible, cost effective and scalable solution, it had made best use of leading open source technologies such as **ForgeRock** and **Red Hat** together with the cloud computing services provided by **AWS**.

Smart421 designed and delivered the platform which is now hosted in the cloud by **Amazon Web Services (AWS)** and, besides meeting the rail industry's current and future needs, will also result in substantially reduced operating costs compared with the previous system.

**Brian Jones**, head of programmes at RSP, said: "This procurement, which forms part of RSP's Modernisation Programme, meets the core objective providing a better match between service capabilities and the industry's needs whilst delivering updated business activities at a lower cost of ownership. This project is key to modernising RSP's services over the next few years. Smart421 should be commended for its capabilities. Their work represents excellent value for money."

Smart421, which is part of the FTSE250-listed **KCOM Group**, became the first Advanced Consulting Partner in the UK under the **Amazon Partner Network** in July 2012. It specialises in high-end consultancy, integration and service management work on business-critical systems for enterprises operating in regulated markets.

**Contact:** [www.smart421.com](http://www.smart421.com)

## FUNDING & INVESTMENTS

### London Stock Exchange launches help programme for high growth companies

The LSE continues to fly the flag for the UK's growth companies with the launch of **Elite**, its business support initiative, designed for ambitious firms that will sent on a two-year programme with **Imperial College Business School** and various advisory and investment communities, said **Umerah Akram**, ELITE director at London Stock Exchange.

The first cohort of 19 companies was unveiled at a launch event at Imperial College Business School, and included Barnsley based business, **Company Shop**.

Mr Akram said "By participating in the 24 month ELITE programme, these firms will gain the information, contacts and possible funding to help them further grow their businesses. We know the programme works because it has run successfully in **Italy** for over two years, with 130 companies. Major trade body backers include the **ABI, BVCA, CBI, QCA** and **Tech City**.

**Contact:** [www.elite.londonstockexchange.com](http://www.elite.londonstockexchange.com)

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## **BigChange provides a mobile computing system for blue collar entrepreneurs**

In 2014 technology pioneer and founder of **Masternaut, Martin Port**, who is one of **Yorkshire's** most successful serial entrepreneurs, started BigChange, which provides a computing network for 'tradesmen, commercial drivers and blue collar entrepreneurs'. BigChange is selling the device and software in 11 countries and Port is targeting 100,000 subscribers within three years.

It involves a mobile device that enables drivers to provide updates on their progress, communicate with HQ and be guided to their destination simply and efficiently, while allowing the business owners to get real-time updates and track drivers, so issues can be quickly addressed.

"It's a revolution in what we're developing here. We are providing a system that takes the pain away and makes businesses more efficient," says Port. "We've developed the system with the customer. It makes drivers safer, while taking all the paperwork out of vans and trucks. This delivers a tangible return on investment, and because it helps small businesses quickly grow and be more productive, we're confident of hitting a target of having 200 staff in the business within the next couple of years."

Sales already concluded include buses in **Budapest**, fire brigades in Germany and North Africa, telecoms in **Portugal**. Port is also in talks with the **United Nations**. Port has experts from major brands on board, including the chief information officer from a major insurance brand.

Port set up his first business at the tender age of 14, printing business cards for local companies. Mr Port established **Masternaut** in 2002 – one of the first UK businesses to offer software as a service in the form of a GPRS-based vehicle tracking service. In the beginning there were only three employees but by 2004 the business was moved to substantial headquarters in **Aberford, Leeds**, and had more than 10,000 subscribers. With average growth of more than 60 per cent every year, Masternaut caught attention. Port sold Masternaut and moved on to **Hub Telecom**.

**Contact:** [www.bigchangeapps.com](http://www.bigchangeapps.com)

## **US-based private equity firm Persephone Capital Partners buys Cella Energy Ltd**

Cella Energy has struggled for funding since it was set up in 2011. However, in June 2014 it was acquired by a consortium of high net-worth investors led by US-based private equity firm **Persephone Capital Partners**.

**Stephen Bennington**, MD at Cella, which was spun-out from the **Science and Technology Facilities Council** in 2011, said: "This is an exciting development. We are pleased with the deal, which will be announced in a couple of weeks' time. We get a back licence from the arrangement that allows us to use any IP that's developed from the aerospace work in other sectors. It's a good deal for us."

In September 2014 this small British company developed a material that can safely store hydrogen, and it has signed a development contract with a 'large aerospace supplier' that will see its technology trialed as a means of providing on-board auxiliary power.

A proportion of the fuel used on an aircraft is converted to electricity in an auxiliary power unit and used for vital electrical systems as well as functions such as heating, lighting and air-conditioning while the plane is on the ground.

The hydrogen-storage material is capable of releasing large quantities of the gas when heated to temperatures above 100°C. It can be produced at scale and at low cost in volume production. The material production uses commercially scalable methods and Cella is capable of making 50kg of the material per day.

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Each gram of material produces up to a litre of **hydrogen gas**, giving it a very high specific energy. The substance can be packaged into a cartridge that, combined with a fuel cell, has two to three times the specific energy of a lithium-ion battery, or to make a system comparable to 700 atmosphere-compressed hydrogen, but without the same safety concerns or infrastructure cost, said the firm.

**Contact:** [www.cellaenergy.com](http://www.cellaenergy.com)

## UNIVERSITY NEWS

### Birmingham spinout Smart Antenna Technologies (SAT) secures investment

Led by Warwickshire venture capital firm **Mercia Fund Management**, the funding syndicate includes angel investors and the company's management team. SAT will use the money to fund product development and sales and marketing activities.

The company launched in August 2013 and is working with consumer electronic suppliers in the mobile phone, laptops and tablets, in-car electronics and micro-base stations sectors.

**Rick Hillum**, CEO of SAT, said "As handset manufacturers are rolling out devices more frequently, they are looking to produce fewer variants. Consumers also want the ability to use their mobile device globally; our antenna provides seamless multi-continent coverage whilst supporting all other integrated functions that would normally require separate antennas.

"We are rapidly ramping-up discussions with a number of the leading portable device manufacturers and chip-set suppliers and remain on course to produce our first antenna later this year."

**Contact:** [www.smartantennatech.com](http://www.smartantennatech.com)

### Cranfield University opens new 'Concentrating Solar Power' laboratory

The new laboratory, the UK Centre for Concentrating Solar Thermal Manufacturing, sponsored by Manchester-based company **Global CSP**, will be the home of an internationally recognised research and manufacturing team led by Cranfield's **Dr Chris Sansom**. It will work on concentrating solar power and solar thermal technologies and their applications.

Global CSP is to design and build the first in a two phase programme of larger power output kits, ranging from 75kW-130kW and then on to 500kW-1000kW (1MW), in collaboration with Dr Sansom. The power plants will be designed and built initially at Cranfield a leading UK university with a reputation for engineering excellence.

**Graham Provan**, CEO of Global CSP, said: "The collaboration between Cranfield University and Global CSP has the potential to make a significant contribution to many renewable energy roadmaps worldwide. We jointly have the talent and passion to be a world leader in small-to-medium-scale CSP applications."

Cranfield has been involved in a number of CSP projects over recent years, including the MATS Project, FRESH NRG, and STAGE-STE, all funded by the **European Union**.

The Cranfield team is also working with **Pakistan's** COMSATS Institute of Information Technology on a solar cooker, to significantly improve the quality of life for rural communities in the developing world.

**Contact:** [www.cranfield.ac.uk](http://www.cranfield.ac.uk) – [www.global-csp.com](http://www.global-csp.com)

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## **New method of cleaning water invented by University of Southampton**

**Professor Tim Leighton** and **Dr Peter Birkin** invented and patented ‘**StarStream**’ technology, which works by enhancing the cleaning power of a stream of water, which might come from a hose, a domestic water tap, or a nozzle in an industrial plant. The device can clean using cold water, or with warm water and with minimal additives, making subsequent water treatment less costly.

While many technologies can clean flat surfaces, StarStream is particularly effective at also cleaning out any grooves and cracks in the surfaces, regions that are difficult for conventional cleaning technologies. Commercial prototypes are being developed in partnership with **Ultrawave Ltd**, for industrial applications such as factory processing lines.

The StarStream device supplies a gentle stream of water through a nozzle that generates ultrasound and bubbles, improving the cleaning power of water with reduced additives and heating.

Furthermore, StarStream can work without having to add detergent to the water, which reduces costs, minimises the risk of run-off polluting groundwater and streams, and simplifies the task of turning the used water back into safe drinking water.

Recent independent tests found that StarStream is ‘1,000 times more effective than water alone’ in decontamination tests of the microorganism *Pseudomonas aeruginosa*, a major cause of hospital acquired infections.

Professor Tim Leighton, from the University of Southampton’s **Institute of Sound and Vibration Research**, who co-developed StarStream, says the team is extremely pleased with the performance of StarStream and the partnership with Ultrawave, noting that it has been a ‘very long road’ from the initial idea to such a product.

“It would be hard to overstate the value of the **Royal Society Brian Mercer Award**, which rescued us by providing a platform to partner with Ultrawave,” he said. “Ultrawave has been searching for the next big idea in ultrasonic cleaning for several years,” says the company’s managing director, John Melville. “We believe that by taking ultrasonic cleaning ‘out of the tank’, StarStream is just that.”

The research was led by Professor Leighton and **Dr Peter Birkin** from Chemistry, initially with their former students **Doug Offin** and **Chris Vian**, with funding from **Dstl**.

**Contact:** [www.ultrawave.co.uk](http://www.ultrawave.co.uk)

## **Plan for ‘Northern Powerhouse’ to push materials research outlined by Chancellor**

In September 2014 **George Osborne** visited the **University of Manchester** to outline proposals for a **National Institute for Materials Research and Innovation**, and to announce a second research programme into graphene, which was isolated for practical applications at the university 10 years ago.

The government’s chief scientific advisor **Sir Mark Walport** has been tasked with building on the North’s expertise in materials science with the development of super lightweight, strong and flexible materials that have applications across a wide range of industries.

Osborne said: “This is another big step in delivering our plan for a ‘northern powerhouse’. Science is at the heart of the economic prospects for the north of England.” Osborne said the plans would put the north of England at the centre of the search for new materials of the future and create new jobs and investment. “That’s what the investment in graphene has already proved.”

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The Chancellor also announced that the University of Manchester is to build a £60 million **Graphene Engineering Innovation Centre** (GEIC) to complement the **National Graphene Institute** – also at the university – which received nearly £40 million of funding in the 2012 Budget and is near completion. Half of the money for the GEIC is coming from Abu Dhabi-based renewable energy company Masdar based. The rest is from the Higher Education Funding Council (£15m) and the Technology Strategy Board (£5m).

Osborne said that the material was a game-changer with properties that make it “one of the most important commercial breakthroughs in recent memory”. He claimed Britain could lead the world in making and manufacturing graphene.

**Contact:** [www.manchester.ac.uk](http://www.manchester.ac.uk)

### **FScan Ltd agrees worldwide licensing agreement with Glide Pharma**

In September 2014 **Durham University** spinout **FScan Ltd** signed an exclusive licensing deal with Oxfordshire-based firm **Glide Pharma** that will see the latter exploit its lanthanide technology.

FScan lanthanide technology uses light energy to measure the level of citrate in seminal fluid samples. The innovation, which can highlight the onset and progression of prostate cancer, was developed by **Professor David Parker** and **Dr Robert Pal**, working in **Durham University's Department of Chemistry**.

The licensing deal includes an upfront fee, development and commercial milestone payments and royalties on future product sales. Prof Parker said “What is pleasing is that some fundamental academic research can now be properly assessed for commercial exploitation and may, in time, offer real benefit to patients.”

Clinical studies, led by renowned consultant clinical urologist **Mark Emberton**, are also underway at **UCL Hospital London** to assess the effectiveness of the citrate test

FScan Ltd was set up in 2008 to exploit pioneering discoveries in analysis of a range of biologically active chemical species

Glide Pharma has plans to adopt the technology in the USA as a so-called ‘analyte specific reagent’, used to identify and measure the amount of a chemical substance in biological specimens. In the longer-term, it intends to create an accurate prostate cancer diagnostic test, pursuing regulatory approval both in the USA and Europe.

Dr Mark Carnegie-Brown, chief executive of Glide Pharma, said: “We believe this innovative technology has the potential to revolutionise the prostate cancer diagnostic market, where there is a clear need for an accurate, rapid non-invasive test.”

The deal represents the latest in a string of success for Durham University spin-outs.

Within the past year, two others, **Kromek** and **Applied Graphene Materials**, have floated on the stock market and attracted a number of high profile contracts.

The university has also produced **Reinnervate**, which specialises in cell growth technologies in the life sciences sector, and **Surface Innovations**, part of the **P2i Group**, a world leader in liquid repellent nanocoating technology.

**Contact:** [www.fscanltd.com](http://www.fscanltd.com)

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## Nano-iron supplement wins RSC's inaugural Emerging Technologies Competition

Scientists at **MRC Human Nutrition Research** have developed a new oral iron supplement that uses nanotechnology to mimic the natural structure of dietary iron. The nano-iron supplement is called IHAT and aims to treat iron deficiency anaemia – the world's most common nutritional deficiency.

It replenishes blood iron stores almost as well as currently available iron supplements, according to a new human trial in the journal *Nanomedicine*, and is designed not to have the unpleasant gastrointestinal side-effects of current supplements.

The supplement won top prize at the **Royal Society of Chemistry** Emerging Technologies Competition – winning £10,000 prize money, which was presented to the winners by the BBC's 'Dragon's Den' judge, **Richard Farleigh**.

**Dr Dora Pereira**, lead author on the paper and co-inventor of IHAT said: "This will raise awareness of the problem of iron deficiency anaemia. We hope to attract further funding to continue trials in humans with the aim of developing an effective and safe treatment for iron deficiency anaemia. After the 10 years hard work that we've put into basic research on how natural dietary iron is digested, and using that knowledge as a basis to develop this new technology, I feel very proud to have received this award."

In the UK alone, iron deficiency anaemia affects 2 million pre-menopausal women and 1 million children. Lack of iron in the body leads to a reduction in the number of red blood cells, which are needed to carry oxygen in the blood. Effects of iron deficiency anaemia may include tiredness and lethargy, shortness of breath, heart palpitations and impaired cognitive development.

**Contact:** [www.mrc-hnr.cam.ac.uk](http://www.mrc-hnr.cam.ac.uk)

## University of Greenwich leads project to make energy out of pink and orange algae

An international team of scientists aim to build a biorefinery called the **D-Factory** to turn an algae called *Dunaliella* into useful products like food, plastics and fuel. Researchers at the Medway campus of the **University of Greenwich** are leading the team, made up of experts from 13 institutions across eight countries.

The €10m (£8m) project is the latest in a series of research coups for the Chatham-based team related to developing algae-based products. One of the main aims of the D-Factory project is to make the process of turning the algae into fuel more economic, as only 80 per cent of its mass can be turned into fuel at present.

Project leader **Professor Pat Harvey** said: "The race is on to develop a broader spectrum of compounds from algae which can be turned into high-value products including food and medicines.

"If we can make algae biorefineries commercially viable, we will have developed a new industry founded on an environmentally-kind raw material which is also sustainable. The potential is huge. By 2020 these algae may also provide us with sustainable fuel – the science is there but at the moment the costs don't add up."

The university has also become a key player in a group of 12 academic centres and companies trying to turn seaweed into liquid biofuel. Backed by £1.6m from the **EPSRC**, the research will explore the conversion of wet seaweed to gas, which can in then be converted to liquid fuel.

**Contact:** [www.gre.ac.uk/about/schools/science](http://www.gre.ac.uk/about/schools/science)

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## Re-design of signal amplifiers for mobile phone masts 'could cut 200MW'

Funded by the EPSRC, the **Universities of Bristol and Cardiff** designed an amplifier that works at 50 per cent efficiency compared with the 30 per cent now typically achieved.

Currently, a 40W transmitter in a phone mast's base station requires just over 130W of power to amplify signals and send them wirelessly to people's mobiles. The new design, however, enables the transmitter to work effectively while using just 80W of power.

If 10,000 base stations in the UK were fitted with the new amplifier, it is estimated that the total saving would amount to half the output of a mid-size, 400MW power station. There are currently around 50,000 phone mast base stations in the UK, so the potential energy and carbon-saving benefits could be even greater. The breakthrough in the design of signal amplifiers for mobile phone masts could deliver a 200MW cut in the load on UK power stations

The team focused on devising sophisticated new computing algorithms for incorporation into its inbuilt electronic management system, as well as on making a number of adjustments to the amplifier hardware. **Dr Kevin Morris**, project leader and reader in radio frequency engineering, **Department of Electrical & Electronic Engineering** at the University of Bristol, said: "This new amplifier design represents a step change in energy efficiency that could make a really valuable contribution to meeting the UK's carbon reduction targets."

**Contact:** Dr Kevin Morris, University of Bristol, Tel: 0117 954 5268, email: [kevin.morris@bristol.ac.uk](mailto:kevin.morris@bristol.ac.uk).

## Thomson Reuters place Norwich as 4th city in UK in terms of most cited scientists

With 12 scientists featuring in the list from across the Norwich Research Park – from **The Sainsbury Laboratory, University of East Anglia** and **John Innes Centre** – Norwich is placed fourth behind **Cambridge, London** and **Oxford**. The study by Thomson Reuters published on the [www.highlycited.com](http://www.highlycited.com) website is a measure of the exceptional impact that scientists are making globally.

The scientists from The Sainsbury Laboratory are: **Professor Cyril Zipfel**, Head of laboratory and whose research is on plant innate immunity to disease; **Professor Sophien Kamoun**, who studies the biology of filamentous plant pathogens, including the pathogen responsible for potato blight; **Professor Jonathan Jones**, who works on plant-pathogen interactions and the development of biotechnological solutions to important crop diseases; and **Dr Joe Win**, a postdoctoral researcher in Professor Sophien Kamoun's lab – Joe works on the pathogen responsible for blight affecting potatoes and tomatoes.

Scientists from the University of East Anglia are **Professor Aedin Cassidy**, whose research programme is focused on bioactive compounds present in plants, with interest in their metabolism, bioavailability and health effects, using a combination of cell/in vitro models and human studies; **Professor Kerry Turner CBE**, who works on environmental and ecological economics; ecosystem services; wetland valuation and management; coastal zone management, waste management; **Professor David Livermore**, whose research centres on the development of methods to rapidly detect antibiotic resistant bacteria in patient specimens; **Dr Ailsa Welch**, whose research focuses on understanding the importance of nutrition to ageing, with emphasis on musculoskeletal health, dietary fat & protein composition, minerals and acid-base balance.

Scientists from the John Innes Centre are **Professor Alison Smith**, who studies how plants metabolise sugars and starch and how these affect their growth and yield; **Professor Caroline Dean**, whose research on vernalization – the period of cold some plants need in order to flower – is leading other studies at the John Innes Centre; **Professor Giles Oldroyd**, who leads research programmes on how cereal and maize crops could be genetically modified to 'fix' their own nitrogen from the air as peas

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and legumes can, with implications for reducing artificial fertilisers and improving yield in the UK and in countries which do not have access to nitrogen fertilisers.

**Contact:** [www.highlycited.com](http://www.highlycited.com)

## LATE DATES

**15 October 2014** – Engineering Science & Technology Fair  
Manchester Central.

This national fair will be attended by over 80 major employers offering thousands of graduate jobs throughout the UK. All employers have vacancies for 2013, many have work placement opportunities and some have jobs with immediate starts. A diverse range of companies are represented from the areas of engineering, science and technology.

**Contact:** [lisa.maycroft@manchester.ac.uk](mailto:lisa.maycroft@manchester.ac.uk)

**16 October 2014** – The Higher and Further Education Show  
Olympia Central, London.

It involves senior decision makers from the worlds of higher and further education to discuss, network, learn and procure services. The line up of speakers are at the forefront of the changes. With the Rt Hon David Willetts, MP Minister for Universities & Science, recently confirmed, you will join senior decision makers and budget holders who are also keen to be the first to hear the latest developments in the sector.

**Contact:** Emily Simpson, [enquiries@heandfeshow.co.uk](mailto:enquiries@heandfeshow.co.uk) – [www.thehigherandfurthereducationshow.co.uk/conference-programme](http://www.thehigherandfurthereducationshow.co.uk/conference-programme)

**21 October 2014** – Venturefest North East  
The Hilton NewcastleGateshead Hotel, Gateshead.

The event is part of the national Venturefest Network and is delivered by Newcastle Science City and supported by the Technology Strategy Board, the UK's innovation agency, and the North East Local Enterprise Partnership. The programme, speakers and exhibitors was announced on 1st September.

**Contact:** [www.venturefestnortheast.com](http://www.venturefestnortheast.com)

**22-23 October 2014** – Engineering Design Show  
Ricoh Arena, Coventry.

Targeted at design engineers over 3,000 attended last year. Over 200 engineering supplier companies will exhibit. With its high level conference, free practical workshops and an exhibition demonstrating and promoting cutting edge technology and innovation, the Engineering Design Show will provide design engineers with all aspects of engineering design under one roof. Co-located Shows include incorporate Engineering Materials Live, covering developments in materials and additive manufacturing technology, and the Electronics Design Show, for engineering and electronic design engineers.

**Contact:** [www.engineering-design-show.co.uk](http://www.engineering-design-show.co.uk)

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**22 October 2014** – Discovering Start-Ups Competition final  
Deloitte, London.

Judges from Cambridge Wireless (CW) and SETsquared – organisers of the DS14 Competition – chose 18 finalists spanning areas from health, education and wellbeing apps, mobile games, e-commerce and wearable tech to network analytics, cyber security, voice and face recognition and tools for developing Internet of Things applications.

Jointly sponsored by Qualcomm Ventures, Google, Microlease and Keysight Technologies, IC Resources, Dorsey & Whitney and supported by Tech City UK, techUK, New Entrepreneurs Foundation and UK Trade & Investment, the £5000 prize package for five winners includes: a ticket to the Mobile World Congress 2015 in Barcelona, a unique opportunity to pitch to the UKTI stand during the MWC15, SETsquared 6 month Virtual membership with mentoring and investor support, Cambridge Wireless Founder Membership for one year, the ticket to Cambridge Wireless 'Future of Wireless International Conference 2015' and a £500 cash prize.

**Contact:** [www.cambridgewireless.co.uk/dsu](http://www.cambridgewireless.co.uk/dsu)

**22 October 2014** – Peterborough B2B Exhibition

The KingsGate Centre, 2 Staplee Way, Parnwell, Peterborough, Cambs PE1 4YT. 9.00am-4.00pm.

With over 75 exhibitors, 6 expert seminars, interactive social media and marketing workshops and a free Speed Networking session, it will be a day filled with opportunities to get connected and create new ways to grow your business. If your target audience spreads beyond Peterborough, there will be hundreds of business visitors from across Cambridgeshire, Lincolnshire and Northamptonshire.

**Contact:** [www.peterboroughb2b.co.uk](http://www.peterboroughb2b.co.uk)

**23 October 2014** – CETC event: computer gaming

St John's Innovation Centre, Cowley Road, Sanger Suite, Cambridge. 6pm.

How Computer Gaming has moved from "just for fun" to a major business sector. Steve Harris is course leader of the Computer Gaming Technology degree course at Anglia Ruskin University, which is one of the UK's key courses to focus exclusively on technology for the Games industry. Steve will give a perspective of the industry and will chart the dramatic growth of Gaming over the last decade. Steve has research interests in the design of serious games and gamification, digital and real-world game based learning and enhancing navigation techniques for the visually impaired. He is also co-founder of "Seven Line Studios Ltd" a game development studio, developing games for iOS and social media. Representatives from other local gaming companies will also participate.

**Contact:** [www.cetc.info](http://www.cetc.info)

**24 October 2014** – London Investor Show

Olympia, London.

An event for private investors, traders and active market participants. Hosted by London Stock Exchange, this is the premier UK private investor and trader event of the year. Speakers include Justin Urquhart Stewart; Sandy Jadeja – on Technical Analysis; Rodney Hobson – 'Building a Successful Share Portfolio'; Alpesh Patel – 'How to Pick Winning Strategies', Edward Page-Croft – 'How to Select Shares'.

**Contact:** [www.londoninvestorshow.com](http://www.londoninvestorshow.com)

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27-29 October 2014 – 12th Annual Medical Innovation Summit  
Cleveland Clinic 10000 Cedar Avenue Cleveland, OH 44106 USA.

Highlights include Innovation Base Camp; New Ventures Healthcare Challenge; Cleveland Clinic Tours; Dinner and One-on-One with Jeff Immelt, Chairman and CEO, General Electric; The Business of Cancer Risks; Personalized Medicine Today; Imaging and Health IT; The Next Generation of Drug Development, and Top 10 Medical Innovations for 2015.

**Contact:** [www.clevelandclinic.org/innovations/summit](http://www.clevelandclinic.org/innovations/summit)

**28-29 October 2014** – 7<sup>th</sup> Offshore Energy 2014  
RAI Amsterdam.

It will see over 10,000 industry professionals and 600 supply chain companies, showcasing their products and services, come together for the fastest growing gathering of offshore industry professionals. Since the first edition in 2008, Offshore Energy has been breaking records year after year, with last year's edition attracting over 9,000 visitors from 56 different nationalities.

As well as the two day exhibition Offshore Energy features an extensive conference programme which offers a unique platform for discussing key topics and solutions for the offshore community. Also running over two days, the conference is made up of a programme packed with C-level panels, technical sessions, masterclasses and meetings of industry organisations. The entire upstream value chain will be represented by both speakers and delegates from all levels of the industry.

**Contact:** <http://offshore-energy.biz>

**29 October 2014** – The Hinton Lecture 2014 – 'Engineering a 21st century Navy', with Admiral Sir George Zambellas  
Royal Academy of Engineering, Prince Philip House, 3 Carlton House Terrace, London SW1Y 5DG.  
6.00pm.

As First Sea Lord Adm Zambellas will describe the extraordinary diversity of engineering and technical innovation within the emerging 21st century Royal Navy, and explore how the future needs of the Senior Service demand radical innovation in technology and leadership.

Tickets for the lecture and drinks reception in London are £10.00 each and dinner tickets are £55.00 each. Tickets for the lecture and drinks reception in Glasgow are £10.00 each.

**Contact:** [www.raeng.org.uk/RAE/media/Events/Programmes/RAEng-Hinton-Lecture-Pr-4.pdf](http://www.raeng.org.uk/RAE/media/Events/Programmes/RAEng-Hinton-Lecture-Pr-4.pdf)

**30 October 2014** – Yorkshire Post Business Awards  
The Queens Hotel, Leeds

The Yorkshire Post has announced the shortlist for this year's Excellence in Business Awards. The awards are open to companies of all shapes and sizes and highlight the inspirational work and unsung heroes in Yorkshire's business community.

**Contact:** [www.yorkshirepost.co.uk](http://www.yorkshirepost.co.uk)

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## AND FINALLY...

>> **Engineers** at London civil engineering landmarks, organised by **Bechtel** and the **Institution of Civil Engineers**, have seen their version of 'Happy' by US star **Pharrell Williams** move to No.1 in 12+ countries... Dancing ability of the engineers? 'Actually, very good!' It ends with a litany of London's latest engineering projects, including the Olympic Park, Alexandra Palace, Crossrail tunnels, Emirates cross-river route Victoria Station re-vamp and Beckton sewage works.

**Contact:** [www.eng.cam.ac.uk/news/time-engineer-some-happiness](http://www.eng.cam.ac.uk/news/time-engineer-some-happiness)

>> For the first time a British city is scrapping large scale parking restrictions in order to re-start the local economy. In 2014 the council in the blighted city of **Sunderland** – one of the poorest and heavily subsidised urban areas of the UK – put the parking regime under the microscope – and re-open the city for business.

Free parking will be introduced in council car parks from mid-November to early January – a unique move by a UK council. A review of parking and loading restrictions across the whole city centre will be scrutinised for the first time in years. **Sunderland City Council's** network operations manager, **Paul Lewins**, said "We have spare capacity in our car parks. They are not full. We have to look very carefully at where we want traffic to be. I think it's probably the case that in the past we have been demand-led. We actually need to be more proactive. Some of the restrictions have been in place for many years."

**Contact:** [www.sunderland.gov.uk](http://www.sunderland.gov.uk)

>> What is the point of being the wife of a dictator if you can't get a quick PhD? People who know **Grace Mugabe**, the 49-year old wife of 90-year old Robert Mugabe, the president of Zimbabwe since 1980, admit she is not exactly known for her academic prowess or intellectual interests. In fact, the only post-high school education she appears to have are a few correspondence courses at the **University of London** more than 20 years ago – but she dropped out after failing most of the exams with marks as low as 7 per cent.

>> She received her PhD in a ceremony at the **University of Zimbabwe** – presided by her husband. She received her degree at an astonishing speed – having spent only four months as a registered student at the school.

**Contact:** [www.uz.ac.zw](http://www.uz.ac.zw)

>> Bewilderment within the IT industry over the recent peerage given to former **Facebook** and **Google** executive **Joanna Shields** continues.

Under Shields's direction, both of her employers sidestepped hundreds of millions of pounds' worth of tax. Shields's appointment would be less damaging if anyone in the technology industry could point to an accomplishment of which she could be proud. But the most significant line item on her CV is presiding over tax planning. It makes her an odd choice for the **House of Lords**. At least one member of Facebook's board, **Reed Hastings**, had never heard of her until after she had left the company.

If the Prime Minister had been serious about getting expertise into Parliament, he could have embraced prolific angel investor **Sherry Coutu**. She is in a different league..

**Contact:** [www.uk.linkedin.com/in/coutu](http://www.uk.linkedin.com/in/coutu)

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