

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

It's Corbyn versus Cameron for the next few years

With the intellectual input of the average Labour voter now fully applied in its most democratic form – a £3 charge and a postal vote – plus tens of thousands of wickedly minded Tory voters – **Jeremy Corbyn** won an unlikely victory in the Labour Party's leadership election.

However, not all of Mr Corbyn's policies are daft. He does believe in the UK taking full charge of its budget, by leaving or marginalising the EU. He wants to put big, untaxable US companies such as **Starbucks** on an equal competitive footing with small, family-owned cafes who pay mountains of tax. Heroically, he wants to put the Man in the Street first.

He also has the sense to dislike **HS2**, rightly seeing it as a ludicrous, rich man's plaything, and views the huge expenditure destined for the new Trident programme with misgivings.

On the opposite side of the Commons Prime Minister **David Cameron** faces his own sizeable set of problems. First, second-term governments are far more difficult than the first. All those awkward problems postponed in the first term now have to be faced. For Cameron these include continued EU membership, the unfunded public pensions mountain, funding the **NHS**, funding the national deficit, coping with a growing downturn in UK manufacturing, the power generation crisis, expansion at Heathrow, losing **London's mayorship**, continued mass immigration – all to be faced with a parliamentary majority of just 12.

The Tories are far from being the 'natural party' in power – which the dramatic demise of both Labour and the **LibDems** six months ago might have you believe. If the Tories can achieve only the slimmest majority against pre-eminently poor leaders such as **David Miliband**, and previously no majority at all against **Gordon Brown**, and now with barely 15,000 paying party members – they have a mountain to face in future.

The Tories now have less than five years to 'de-Brown' the economy and 'de-Blair' society – before a properly organised alliance of left-wing political forces may eventually overthrow them at the next election.

www.gibson-index.com

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 50,000 UK-based technology SMEs.

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COMPANY OF THE MONTH

Edinburgh University has high hopes for fast-growing technology firm FanDuel

The company, a fantasy sports league enterprise, with roots in the **School of Informatics**, recently secured \$275m of investment. During 2014, **FanDuel** plans to pay out over \$400 million in prizes – up from \$150 million in 2013, \$50 million in 2012, and \$10 million in 2011. Veteran IT entrepreneur **Marc Moens** is a director.

The development team use agile techniques and short sprint-cycles to create a fantasy sports engine that handles 3 million entries a week on average, with over 25 thousand of those per hour at busy times. They operate one of the largest transactional websites in the UK and this throws up countless interesting technology challenges.

In November 2014 FanDuel announced a strategic deal with the **National Basketball Association** (NBA). As part of the deal the NBA gained an equity stake in FanDuel and will be promoting FanDuel as the “Official One-Day Fantasy Basketball Game”.

As of May 2014, the company employs a total 80 people, with the staff being split evenly between the **Edinburgh** and **New York City** offices. In September 2014, the company announced \$70 million in Series D funding. The round was led by **Shamrock Capital Advisors** with participation from **NBC Sports Ventures** and **KKR**. Previous investors **Bullpen Capital**, **Pentech Ventures** and **Comcast Ventures** also participated.

On February 12, 2014, FanDuel announced that it was restricting real money play for players from Washington state due to the uncertain legality surrounding the state. “We did a full review of all 50 states and Washington was the only one that we identified as problematic” says CEO **Nigel Eccles**. FanDuel already restricts play for players from Arizona, Iowa, Louisiana and Montana.

Earlier, in January 2013 FanDuel closed an \$11m Series C funding round. The round included investor Comcast Ventures, along with previous investors **Piton Capital**, **Pentech Ventures**, **Bullpen Capital** and serial investor **Richard Koch**.

Back in 2009, after taking in \$1.2 million in venture capital funding from **Pentech Ventures** and **Scottish Enterprise**, **Hubdub** undertook an internal review and decided to shift focus from its web-based prediction market game to a web-based daily fantasy sports premium game. Hubdub therefore launched FanDuel while the Hubdub website was shut down on April 30, 2010.

Contact: www.fanduel.com

SME NEWS – ENGINEERING, CONSTRUCTION & ENERGY

Sheffield based R&D Faradion Ltd offers the first sodium-ion powered vehicle

Following investment from **Finance Yorkshire**, Faradion is pioneering low-cost sodium-ion battery technology, capable of reducing the cost of renewable energy storage. Unusually, both **BBC World News** and **Sky News** have featured Faradion’s technology in recent months.

The recent e-bike vehicle demonstration, which was led by Faradion and supported by **Williams Advanced Engineering** and **Oxford University**, was a proof of concept designed to showcase the capabilities of sodium-ion technology.

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Faradion's pioneering technology enables the replacement of lithium-ion batteries with the more commonly available and sustainable sodium, without impacting adversely on any of the key performance characteristics of current large scale batteries.

Sodium-ion batteries are considerably less expensive than their lithium-ion counterparts, offering savings of at least c. 30% in terms of cost per kWh. They also have significant safety advantages, as they can be transported in a totally discharged state.

Finance Yorkshire's **Seedcorn Fund** initially invested in Faradion in 2011 and has since made follow on investments. Faradion chairman **Chris Wright** said: "The development of a sodium-ion powered e-bike was a major milestone for our pioneering technology, and demonstrated its capability. Sodium-ion batteries have the potential to revolutionise the supply of electric batteries for stationary storage and automotive applications.

Investment Director at Finance Yorkshire, **Ashwin Kumaraswamy** said: "Since our most recent investment last year, the business has ramped up its development considerably, not least with the demonstration of the e-bike and exposure on the national news. With various patents pending and advanced technology applicable to both power and energy applications, Faradion is in a perfect position for real success."

Contact: www.faradion.co.uk

Penultimate Power UK Ltd proposes small modular nuclear reactors

While the news that **China** is to finance a new full-scale nuclear power station sinks in – the UK's new energy minister Andrea Leadsom supported a new set of factory-built, nuclear power stations – with a Newcastle company leading the way on their development in the UK.

As a result, home-grown generation of **Small Modular Reactors (SMR)** – to be built by Newcastle company **Penultimate Power**, may have a future. The firm was formed in 2012 by long-standing nuclear power advocate **Ian Fells**, emeritus professor of energy at Newcastle University.

It seeks to pioneer the world's first SMR on land next to the existing **Hartlepool** nuclear power plant. Speaking at the **Nuclear Industry Association** conference Ms Leadsom said: "Small Modular Reactors are an option we are investigating further. These have the potential to drive down the cost of nuclear energy and make financing easier through shorter construction times and lower initial capital investment requirements, in addition to high-value commercial opportunities."

A Government-commissioned study, published late last year, and funded in part by UK companies **Rolls-Royce**, **Atkins** and **Amec** concluded that SMRs could work out at £67/MWh circa – 20% less than the current nuclear programme and cheaper than all other existing renewable energy sources.

The current nuclear programme sees the UK committed to developing at least five new power stations, contributing 16GW of low carbon electricity by 2025, when almost all of the existing fleet will be closed down.

Candida Whitmill, MD of Penultimate Power UK, said: "This is a great opportunity for our UK nuclear supply chain, particularly here in the North East and we look forward to continuing to work with Government and our partners to bring a successful project to fruition." Prof Fells says there are some 150 North East supply chain companies who could benefit from the development of SMRs in the region.

Contact: www.peultimatepoweruk.com – Ian Fells: ian.fells@muckle-llp.com

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Artemis Intelligent Power scoops RAENG's MacRobert Award

Scottish firm Artemis Intelligent Power, a company that has developed a novel technology combining hydraulics with electronics said to be capable of reducing the cost of offshore wind energy, won the **MacRobert Award**, the Royal Academy of Engineering's top prize.

The company's technology can also be used to reduce the fuel consumption of trains and make hybrid buses more affordable. But it is offshore wind power where the Edinburgh firm could make the most impact. Although Britain could generate 8-10% of its energy from this source by 2020, and already provides 15 terawatt hours (TWh) of electricity each year, the cost of the technology makes its deployment challenging.

Its **Digital Displacement** system combines hydraulics with analogue control with a system of digital microcontrollers that switch each individual cylinder on and off in real time as the shaft rotates. This combines the advantages of hydraulics – high power density, compactness, and low cost – with the efficiency of electric technology.

Artemis MD **Dr Niall Caldwell** said "We've demonstrated machines at 97% efficiency. That is unheard of in hydraulics. It is a dramatic improvement that allows you to build a hydrostatic transmission system from shaft to shaft with a pump and a motor that is competitive with electric technology."

This meant hydraulic transmissions could be used for offshore wind, as opposed to conventional gearbox transmission systems. The hydraulic systems could prove to be more reliable, Caldwell said, reducing offshore wind turbine downtime and maintenance costs. "There is a big issue in terms of the reliability of offshore wind turbine gearboxes, and, if they do start failing, how they are going to be repaired quickly and cost-effectively."

Artemis, which has been going for more than 15 years, is owned by **Mitsubishi Heavy Industries**. In 2014, Artemis's Mitsubishi joined forces with Danish company **Vestas** to form a new joint venture dedicated to offshore wind turbines.

The world's largest offshore floating wind turbine is also employing it, offshore of the **Fukushima** plant in Japan. Floating platforms are necessary there because of the depth of the water, Dr Caldwell said.

Contact: www.artemisip.com

BIS backs a raft of 20 new supply chain projects across the UK

Among the 20 projects is **Applied Design Engineering's** scheme to develop and produce a new type of energy-efficient refrigerated retail display cabinet to store and present perishable foods.

The Lowestoft-based business, which trades as **Adande**, will be receiving a £2.1m grant and a loan of £380,000 as part of the £4.2m project with **Plas-Tech** and **Bond Retail Services**. The project will create up to 97 jobs and safeguard 144.

In addition, **Process Systems Enterprise** is set to secure a £12.2m grant as part of a £20.4m project with **Pfizer**, **GSK**, **Bristol-Myers Squibb Pharmaceuticals**, **AstraZeneca UK**, **Perceptive Engineering**, **Britest**, **Cambridge Crystallographic Data Centre**, **University of Leeds**, **University of Cambridge**, **STFC** and the **University of Strathclyde**.

The project will develop new digital design and manufacturing processes for drug products. It will create up to 94 jobs and safeguard 729 jobs.

Contact: www.adanderefrigeration.com – www.psenderprise.com

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Two firms face decline due to Government's withdrawal of support for wind farms

The UK Government decision to curb onshore wind has led the turbine factory and steel manufacturer Mabey Bridge to announce plans to close it – with the loss of 125 jobs.

The firm said it is proposing to close its renewables division in **Chepstow**, Monmouthshire, with the “uncertainty of market conditions for the UK onshore wind industry” in the longer term a contributing factor. The move follows a failure in exhaustive efforts to find a buyer for the business as a going concern, the company said.

The news comes after the Government announced it was ending subsidies for new wind farms a year early, to meet a pre-election pledge to halt the development of onshore wind.

Juliette Stacey, chairman of Mabey Bridge, said: “This is not a decision that we have taken lightly and we understand that this is a very difficult time for our people. Since December 2014, we have made every effort to try to find a buyer. The uncertainty of market conditions for the UK onshore wind industry in the longer term has been a contributing factor.

In a second move, the Widnes engineering firm **Hutchinson Engineering** ended plans to expand. The company, which employs more than 100 staff, fears its new £5 million factory will be worthless.

It is the leading UK manufacturer of telecoms structures – about a fifth of work comes from the wind sector. Hutchinson is also the only company in the UK which supplies medium sized wind turbines. Business development director **Neal Scrivener** said: “It is a devastating time for us. We made a huge investment and were hoping to double staff in our factory and take on an extra 15 employees in our factory. This makes a huge difference. It is totally out of our control.”

Contact: www.mabeybridge.com – www.hutchinsonengineering.co.uk

Plymouth engineering firm Hymec Aerospace fights to stay in business

Once seen as a business leader in the South West Hymec has recently called in troubleshooters as it fights to deal with up to £4 million in debts.

Until recently **Hymec Aerospace (UK) Ltd** was viewed as one of Plymouth's most impressive manufacturing success stories. But with the sector hit by economic shockwaves coming from **Russia**, **China** and the **Eurozone**, it has made staff redundant and is now looking at entering a Company Voluntary Arrangement (CVA) to pay off creditors less than they are owed.

It is understood the firm has liabilities of between £3-4m, although it does have assets. Hymec, which makes high-quality seat components for first-class and business-class cabins in the world's major airlines, has called in Plymouth-based accountancy and business recovery practice Lameys to approach creditors.

A spokesman for Lameys confirmed the intention of setting up a CVA, and added: “While it's not ideal for the company's creditors or employees that have been made redundant, the company will continue to trade and jobs will be saved.

The decline in Hymec's fortunes comes after the firm underwent huge expansion in 2013 and 2014. It saw staff increase from 50 to more than 100 and moved from a 16,000sq ft plant at Darklake View to a 60,000sq ft factory at nearby Plymbridge Road, Estover in 2014, doubling the number of computer-controlled machines it uses to cut, drill and shape metal into aircraft seating components. The company saw turnover hit £6.2 million 2014 as a result.

Contact: www.hymec.net

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The 'Non-Intrusive Crossover System' – an ingenious innovation to help rural rail

The Non-Intrusive Crossover System (NICS) has been designed to provide a low-cost means of installing rail siding access from the main line where the cost of conventional connection would be too high for the levels of rail traffic likely to be involved.

Studies back in 2006 demonstrated that NICS could have particularly useful applications for timber transport along the **West Highland lines** from Glasgow, from Inverness to Kyle of Lochalsh and Caithness, and on the Ayr-Stranraer route serving the extensive South Ayrshire and Galloway forests.

But the innovation could be much more widely applied – to speed passing trains during engineering works – something all commuters would applaud. The NICS allows the movement of a train from the main line onto a siding without cutting into existing rails – an approaching train travels over a hinged assembly of temporary rails, raised 50mm above the height of the existing rails and then reaches the physically separate semi-permanent siding.

Conventional signalling is not required, as NICS is deployed in a “possession environment”, as is the case when railway engineers take possession of the main line for repair or renewal work. The kit has already been successfully deployed on major engineering possessions on the **Tyne & Wear Metro** network.

NICS was recently used with success on a major railtrack repair project on the Tyne and Wear metro. The track to the six stations from Wallsend to Tynemouth was under repair for 23 days from 11 August 2012. During this time **Balfour Beatty Rail** (BBR) completed the renewal of 5,646m of twin track, complete with new ballast and new concrete sleepers.

BBR said the railtrack repair work could not be carried out within the allocated time (23 days) without BBR using the NICS crossings, set up within the section of the track under repair.

Contact: www.nicsrail.com

Newcastle's historic Armstrong Works reopens – as 'screwdriver plant' for Hitachi

In the past the **Armstrong Works** produced the hydraulics for the city's Swing Bridge and London's Tower Bridge, as well as parts for Spitfires and the 'bouncing bombs' used by the Dambusters. It also made the first breech-loading gun for the war in Crimea and Chieftain tanks during World War II. It closed in 2012 when **BAE Systems**, the former owner of the site, announced in 2012 that it was closing the factory with the loss of 330 jobs.

In early September 2015 the factory reopened after £20m in renovation works. Now, a multimillion-pound cash injection has revived the vast structure, which stretches the length of five football pitches along the **Scotswood Road**, and reinvented it as the new home of engineering company **Reece Group** and its 500 employees.

Family-owned Reece Group is the holding company of engineering businesses operating in the defence, oil and gas, power generation, construction, medical and subsea markets.

Reece Group chairman, **John Reece**, said: “The new facility provides our group companies with an outstanding capability which is already attracting a wide range of new customers to each of our engineering businesses as well as increasing our scope to supply existing customers.” His father, the late **Dr Alan Reece**, developed his enthusiasm for what he called 'real engineering' in his first job as an apprentice for **Vickers Armstrong**.”

Contact: www.reece-group.com

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Nine 'space sector' companies leave for US on UKTI/Innovate UK trade mission

While Innovate UK's staff are often prone to exaggeration when talking about the future prospects of various British industries – they excelled themselves during a recent space-related trade mission in August.

Innovate UK claims the sector 'employs 37,000 people and has revenues of £7.5bn'. The true figure is about 1:20th, once entirely irrelevant broadcasting and phone revenues are deducted. This is the equivalent of saying: 'My dog is worth £10,000 because that is the cost of its pet food'. Two of the firms enjoying the sunshine of Utah – **Bird.i** and **Gyana** – are little more than student projects. Hard-headed electronics and instrumentation firms were few in number.

The mission first visited the **Small Satellite Conference** in Utah, hosted by **NASA's** Jet Propulsion Laboratory, before leaving for California to meet teams from NASA, **Virgin Galactic** and **Lockheed Martin**. Two of the nine firms are barely more than student projects, however.

One firm, **Mars Space Ltd**, provides services and consultancy on space propulsion, plasma engineering and science, while **Oxford Space Systems** set its sights on becoming the leading global supplier of deployable space structures. Soon after the mission Oxford Space Systems announced it had secured a '£2m contract'.

Others include long-serving SME **Printech Circuit Laboratories**, which has been manufacturing circuitry for the space industry for 20 years; **Scot Sat**, which offers ultra-high speed mobile satellite communications at low cost; and **PocketQube Shop**, a one-stop-shop for custom-built satellites costing less than a family car.

Last but not least, **Bird.i Ltd** – a startup that makes earth observation and satellite data 'socially useful'. It has worked with **The European Centre for Space Applications and Telecommunications** (ECSAT) is **ESA's** new facility in the UK. It is based at the **Harwell Science, Innovation and Business Campus** in Oxfordshire.

Contact: www.innovateuk.gov.uk

Institution of Mechanical Engineers makes first award to SMEs from new £2m fund

The IME is 'going back to its roots to fund inventions likely to be useful to the world'. The IME was founded in 1847 by **George Stephenson**, known as the father of Britain's railways and the inventor of the safety lamp, and the body is now giving financial backing to start-ups that follow his aim when he set up the organisation to "give an impulse to invention likely to be useful to the world".

Chief executive **Stephen Tetlow** said "These investments by the institution are not just about providing monetary investment, but about connecting these and other companies to the vast resources and network of the institution and its membership.

Five companies were awarded support from the **Stephenson LP** fund, which is intended to back research in innovative fields of mechanical engineering. These are:

- **Lontra**, which makes compressors which abandon conventional piston and cylinder designs for a "blade compressor" in a doughnut shape with the piston rotating inside it . The system has been shown to be 20 percent more efficient than conventional designs, and with compressors responsible for 10 percent of industrial energy consumption, could deliver huge benefits if it goes into wide-scale use.

www.lontra.co.uk

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- **University College London** spinout **Amalyst**, which has developed fuel cells which do not need platinum to generate hydrogen power from water through electrolysis, making them much cheaper than current versions. Growing interest in hydrogen-powered cars means this technology could gain traction in the auto sector.
www.amalyst.com
- **Oxford Space Systems**, which is making lighter, cheaper and less complex moveable antennas, booms and panels mainly for small satellites. The company has signed contracts with leading players in the European space industry and is aiming to set a record of going from concept to space flight in three years.
www.oxfordspacesystems.com
- Sensor company **Oxsensis**, which uses light to measure heat, temperature and pressure in harsh environments such as jet engines, energy uses and power stations. Oxsensis's non-electrical systems use sensors made out of materials such as sapphire that are connected by fibre optic cables as long as 1km. As light is not affected by heat and electromagnetic interference, they are able to give accurate readings. The Oxfordshire-based business has agreed partnerships with aviation companies, including **GE**.
www.oxsensis.com
- **Tokamak Energy**, which is working to speed up the introduction of fusion reactors that have the potential to provide limitless clean power from joining atoms, rather than splitting them. Tokamak is investigating how fusion could be achieved in small reactors, which it believes could be built in factories or even shipyards, rather than being huge civil engineering projects.
www.tokamakenergy.co.uk

Contact: www.midven.co.uk/funds/Stephenson

Awards for five physics-based firms handed out by the Institute of Physics

All five winning companies will be showing their innovations at a parliamentary reception on 28 October, and will also attend an awards ceremony in London on 5 November.

Frances Saunders, president of the **Institute of Physics**, said: "From veterinary MRI scanning to subsea pipeline inspection and from all over the UK, this year's impressive selection of winners proves once again that the successful application of physics can create businesses and transform industries."

First, Glasgow's **M Squared Lasers Ltd** picked up an Innovation Award for their contribution to laser technology with the development of SolsTiS, a compact and fully automated laser toolkit offering unprecedented tuning range and unrivalled power.

Founded in 2006, M Squared Lasers Ltd now has more than 150 customers globally, has reached over £14 m through sales and has created 50 full-time jobs in Scotland.

Next, Tracerco, based in Billingham, received an award for developing Discovery, an instrument that has revolutionised the oil and gas industry by being able to non-intrusively inspect complex sub-sea structures. Before the invention of Discovery, it was incredibly difficult to inspect subsea pipelines and determine the cause of a blockage without the need to stop production or remove protective coatings.

Thirdly, a unique standing equine MRI scanner developed by Guildford's **Hallmarq Veterinary Imaging Ltd** has revolutionised diagnostic methods. It can locate the cause of pain in a lame horse to a particular region, but further diagnosis is notoriously difficult. MRI can visualise both bone and soft tissue, making it the gold standard imaging modality.

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Fourth came Malvern's **Metrasens Ltd** – for its innovative Ferromagnetic Detection Systems (FMDS) that can significantly reduce dangerous projectile and pacemaker failure accidents in MRI scanners.

Lastly, **Silixa Ltd** based in Hertfordshire, developed the Intelligent Distributed Acoustic Sensor (iDAS), a seismic-imaging instrument which turns a length of standard optical fibre into a string of precision microphones. iDAS technology records the full acoustic signal simultaneously at every 1m over up to 40,000 data points and is used to collect uniquely high-resolution seismic data from within oil wells and from carbon capture and storage reservoirs. Optical fibres are often found in wells to provide communications to pressure and temperature gauges and

Contact: www.iop.org/activity/business/innovation/2015-winners/page_65913.html
– www.hallmarq.net – www.m2lasers.com – www.metrasens.com – www.silixa.com –
www.tracerco.com/subsea/discovery

SME NEWS – ELECTRONICS & TELECOMS

Custom Interconnect 'sees upturn after five years of recession', says CEO

Craig Wright, CEO of Andover-based electronics manufacturer, **Custom Interconnect Ltd** (CIL), said "There is innovation again. After the recession of five years ago, we see firms starting to look for new markets again," says Wright. "I know of one customer which is making the UK a design hub for its global business."

Custom Interconnect is one of the fastest growing electronics manufacturing services businesses within the UK. The company designs, tests and manufacturers a wide range of safety critical and high reliability electronics including secure radio frequency devices and specialised LED based products. The business was also awarded ISO 13485 approval for the manufacture of medical devices including full product build.

Wright says that the much-commented on turnaround in the UK's automotive sector has given new confidence to the manufacturing sector as a whole. There is an appetite for banks to invest in manufacturing business again. Wright was surprised how response banks were when he was looking for investment funding last year.

Wright saw an up lift in business starting back in 2013 and he expects this to continue for the rest of this year. UK manufacturing is back with a vengeance, as Wright puts it: "New business tenders may now have two or three UK-based bidders to one from overseas.

Electronics manufacturer, Custom Interconnect Limited, has secured funding from the Government-backed **Growth Accelerator** scheme to assist with its plans for growth.

MD of the company, **John Boston**, said: "Following significant investment in our business over the past few years, including a separately located 8,000 sq ft secure Box Build and Hubbing facility complete with class 10,000 cleanroom for medical device build, we are now expanding the scope of our business by entering new markets. Investing in management and leadership skills will be a critical step in delivering the potential our business has."

Contact: www.cil-uk.co.uk

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Little-known UK tablet maker Bouncepad signs contract with PayPal

The partnership agreement enables Bouncepad's PayPal tablet enclosure and custom card reader cradle to be purchased alongside the new **PayPal Here** card reader.

"We're excited to extend our long-standing relationship with PayPal to continue helping small businesses innovate their POS systems," said **Tobi Schneider**, CEO of **Bouncepad**.

"Working together, we're able to offer a sophisticated tablet POS solution that helps small business owners across industries like hospitality and retail make it simple and affordable to join the contactless payment revolution."

The London-based tablet manufacturer specialising in POS technology joined with PayPal to create an efficient contactless solution for SMEs and consumers. Once small business owners have registered with PayPal Here, they can use the products to start accepting contactless payments from their customers.

The tablet firm has shipped its products to more than 45 countries worldwide, working on major deployments for brands including **Adidas, McDonald's, Ralph Lauren, Tommy Hilfiger, Virgin and Visa**.

Currently the contactless payment limit in the UK is set at £20, but plans are in place to raise the limit to £30, helping SMEs increase their profits while making it easier for customers to pay for goods.

Small business owners have already started using POS products, but many products are accompanied by the hassle of expensive costs, software licenses, long-term contracts and card payment processing fees. The Bouncepad solution claims to be cheaper and more accessible for small businesses in the UK.

Contact: www.bouncepad.com

Trinity Audio Engineering Ltd design rather clever in-ear headphones

In April 2015 Belper, Derbyshire-based Trinity, said its latest in-ear monitors (IEM), exceeded its **Kickstarter** target of £40,000 after only eight days. Raising funds to develop its range of three UK-designed and manufactured IEMs, Trinity exceeded its target with an impressive 22 days still to run, with backers continuing to pledge to the campaign. The funds raised enable the company to continue its development and bring the products to market, with investment particularly focused on tooling, packaging and production component costs.

Although a new name to the personal audio market, Trinity's founders have years of experience creating award-winning IEMs for other brands. By bringing unique features, class-leading build and years of personal audio knowledge from the highest level, the Trinity team set out to create products that deliver high-end audio performance at very realistic prices.

Bob James, chief designer at Trinity, said, "With the wealth of earphones on the market today, we feel that there is a real demand for products that offer true audiophile performance at very realistic prices. Every Trinity product is engineered foremost for its sonic performance and the results speak for themselves."

They are familiar with the finer details of manufacturing in-ear monitors. During the course of first successful Kickstart campaign they were contacted by a large number of people that wanted to know if we would ever build a sports use Trinity IEM.

They have designed a high end in-ear sports headphone, and came back for a second funding round. They will build up to prototype stage and now need help to proceed further.

Contact: www.trinityaudioengineering.com

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Fast-growing broadband provider Gigaclear given three new contracts

The small but growing fibre-to-the-premises (FTTP) provider signed a deal with **Superfast Berkshire** to bring fibre to 11,700 homes and businesses in West Berkshire. Earlier, Gigaclear was awarded contracts in **Essex** and **Gloucestershire**.

Alternative service provider Gigaclear picked up three contracts under the second phase of the UK government's **Broadband Delivery UK** (BDUK) programme, which aims to infill gaps in broadband coverage in rural areas, said **Matthew Hare**, chief executive.

The UK government had initially set aside £530 million of public funding to help BDUK extend superfast broadband – defined as download speeds of 24Mb/s or faster – to reach 90 per cent of premises by 2016.

All 44 contracts under the first phase of the BDUK programme were awarded to **BT**. In the second phase, local authorities looked outside the framework, as they seek new ways to bring broadband to rural communities – the so-called 'Rural Challenge'. The three contracts won by Gigaclear were awarded under this second phase, and are the first to be awarded to an operator other to BT under the government-subsidised BDUK programme.

In order to bid for the contracts, Gigaclear is also required to make a significant investment of its own. In West Berkshire, Gigaclear will invest more than £4 for every £1 of state aid, contributing nearly £16 million to transform the online experience for all those living in the project area. Public funding of £3.7 million from BDUK, **West Berkshire District Council** and **Thames Valley Berkshire Local Enterprise Partnership** and the private investment of £16 million from Gigaclear will provide a total investment pot of almost £20 million.

To fund its roll-outs, in May 2015 Gigaclear secured £20m in equity commitments from new investor Infracapital, the infrastructure investment arm of **Prudential**, and a further £10 million from existing shareholder **Woodford Investment Management**.

Contact: www.gigaclear.com

Solar Communications included in the '1,000 Companies to Inspire Britain 2015'

The list, the second to be published by the **London Stock Exchange Group**, identifies landmark, mostly mid-sized companies in a wide variety of sectors. Solar's annual turnover has grown from £2m to £13m in seven years, and in the financial year January to December 2014, Solar reinforced its position as a leading reseller of technology solutions, securing 610 new contracts and delivering year-on-year profit growth of 78 per cent.

The figures are testament to Solar's focus on the customer experience and providing value at every stage of engagement, wrapped up with tailored services and support.

Solar Communications's CEO, **Mark Colquhoun**, is a driving force in the development of the company.

Mr Colquhoun, said "Solar are aiming to innovate within the telecommunications and IT sectors. Our market approach ensures we maximise growth potential through a strong portfolio of products, from some of the world's leading technology vendors, wrapped up in exceptional customer service and support."

Contact: www.solar.co.uk

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Electronics manufacturer Acal plc reports a 39% sales increase

Acal designs, manufactures and distributes customer-specific electronic products and solutions to around 20,000 industrial manufacturers in all major geographies. It was also significant that sales outside Europe increased to 15% of overall revenues.

The group works in a wide range of technology areas, supplying temperature sensors for coffee machines, customised transformers for healthcare CT scanners and cable assemblies for stair lifts.

Nick Jefferies, group chief executive said: "Trading has started well, and as expected, although we remain mindful of strengthening foreign exchange translation headwinds. The order book remains strong and we have a healthy pipeline of acquisition opportunities, with debt funding resources available." The firm's most recent acquisitions, Noratel and Foss are performing well and already contributing growth to the business, said Jefferies.

Acal's key markets are in Europe, with increasing presence in the US and Asia. The firm has two divisions: **Custom Distribution** and **Design & Manufacturing**. The majority of its sales comes from products and solutions which are either created uniquely for a customer or sourced exclusively. Acal works across a range of technologies, namely communications and sensors, electromechanical, imaging and photonics, microsystems and displays, and power and magnetics.

Acal operates through these wholly-owned businesses: **AcalBFI**, **Foss**, **Hectronic**, **MTC**, **Myrra**, **Noratel**, **RSG**, **Stortech** and **Vertec**. It has operating companies and manufacturing facilities in a number of markets.

Contact: www.acal.co.uk

SME NEWS – CHEMICAL, MATERIALS & ENVIRONMENT

Imperial's metals tech business wins a total of £4m in funding round

Imperial Innovations Group led a £4.0m funding round in **Impression Technologies**, an aluminium-forming technology business based on IP developed at Imperial College London. Innovations invested £0.5m in seed funding in Impression Technologies in February 2013 and has now committed a further £2.5m in this round alongside **Mercia Technologies**, an existing investor.

Following this new investment, Innovations will hold a 59.9 percent stake in the issued share capital of the company, said Impression Technologies CEO **George Adam**. Impression Technologies specialises in developing technology for forming complex, high-strength, lightweight components for the transportation industry. The company's patented solution heat treatment, forming and in die quenching technology developed by Impression Technologies and Imperial College, allows a wide range of aluminium alloys, including ultra-high strength grades, to be formed in a fast pressing operation without compromising the strength or metallurgical properties of the material.

The result is complex but lightweight components, which can be used in the manufacture of cars, trains and aeroplanes. The funds will be used to acquire a press and establish a press facility in collaboration with Impression Technologies' first licensee, PAB Coventry, in order to continue development of the technology, and to keep up with customer demand. PAB is currently supplying parts, to the motor industry.

Contact: www.imperialinnovations.co.uk

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‘Fuel from whisky waste’ company wins an £11m government grant

In September 2015 Scottish biofuels specialist **Celtic Renewables** won an £11m government grant to help build a plant that produces biofuel from residues of the whisky industry.

One of three biofuels producers to share in a £25 million funding pot awarded by the **Department for Transport** (DfT), the Edinburgh-based firm will use the cash to build a biofuel facility that will be operational by December 2018. The company claims that it will produce at least 1 million litres of biofuel – capable of powering cars – every year.

Prof Martin Tangney, the company’s founder and president, explained that the facility will be used to carry out or acetone-butanol-ethanol (ABE) fermentation.

This process uses bacterial fermentation to produce biofuels from carbohydrates such as starch and glucose. It was originally devised in the UK at the start of the last century to produce acetone for explosives used in the **First World War**, but was phased-out in the 1960s due to competition from the petrochemical industry.

During the firm’s process, biofuel is produced from draff – the sugar-rich kernels of barley which are soaked in water to facilitate the fermentation process necessary for whisky production – and pot ale, the copper-containing yeasty liquid that is left over following distillation.

In addition to the DfT funding the firm has already attracted private sector investment, and is currently looking at opening a demonstration facility close to Grangemouth in Stirlingshire. The two other companies to win DfT funding are Teesside-based **Nova Pangaea**, which produces biofuel from forestry waste, and Swindon-based **Advanced Plasma Products**.

Contact: www.celtic-renewables.com – www.novapangaea.com – www.advancedplasmaproducts.com

Cambridge Nanotherm makes a strong start to 2015 with growing sales

Cambridge Nanotherm installed its first production line in March 2014, making nanoceramic thermal management products, particularly in the LED lighting market.

Ralph Weir, CEO of Cambridge Nanotherm, said “Upgrading our systems was necessary to cope with the demand. Many electronic and LED manufacturers are starting to realise the thermal benefits of working with nanoceramics, which are simultaneously cheaper than high-end ‘metal PCB’ materials and higher performance.”

Cambridge Nanotherm’s patented process builds a nanoceramic layer on sheets of aluminium. The material is completed by a layer of copper, and can be converted into a PCB by established manufacturers.

Weir added “The nanoceramic layer acts as a dielectric with exceptional thermal properties, removing heat up to 20% more efficiently than the competition whilst also offering significant cost savings. The upshot is an affordable thermal management substrate / PCB material that outperforms everything else in its class.” Thermal management is used in high brightness LEDs remove heat from the assembly, which extends lifetimes of LEDs.

Contact: www.camnano.com

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Startup Xefro aims 'to slash heating costs with graphene' heating elements

The company claims marks the first time that graphene has been used as a heating element. Depending on the kind of heating system currently used in a home, the company estimates that this graphene-based heating system can reduce energy costs by anywhere from 25 to 70 percent.

Xefro uses graphene-based ink that can be printed on a variety of materials and into just about any configuration. The system takes advantage of graphene's minimal thermal mass so the heat can be turned on and off quickly, and leverages graphene's large surface area so that energy isn't wasted in heating up the heater itself.

Tim Harper, a founder of **Xefro** and co-inventor of the graphene heating element, said "The innovation is all about getting useable heat where it is needed. While it is true that electrical resistive heating is almost 100 percent efficient in converting electricity into heat, it is what happens to that generated heat that is critical."

Traditional heating systems are very inefficient in that they require heat to be transferred to multiple materials: for example, heating up water to heat up a radiator which heats up air and then finally heats up objects in a room, according to Harper.

He added: "Our initial question was 'How can we get the heat directly to where it needed?' and that led us to evaluate a wide range of heating materials and systems before we finally arrived at graphene."

"Because graphene gives us an instant on/off response, this allows a number of smart switching algorithms to be used," says Harper. "The energy savings come when the heaters are deployed as a system throughout a building. The heaters are linked with the control system via Wi-Fi, allowing the system to learn your behaviour as well as the optimum heating required to maintain a comfortable temperature."

Harper says the systems will be available in July 2015 through Xefro's distributors in the UK. It will also be expanding into other markets, with partners and distributors making them available later in the year.

Contact: www.xefro.com

German giant Bosch claims invention of graphene-based magnetic sensor

At the **Graphene Flagship** conference in **Manchester**, **Robert Roelver**, of Stuttgart-based engineering firm Bosch said company researchers, together with scientists at the **Max-Planck Institute for Solid State Research**, had created a graphene-based magnetic sensor 100 times more sensitive than an equivalent device based on silicon.

Bosch has long been involved in sensor technology, most notably in the automotive sector. In 2008, the company expanded beyond its pressure, acceleration and gyroscopic motion sensors, to geomagnetic, temperature, humidity, air quality and sound pressure devices, including for use in consumer electronics devices such as mobile phones. Roelver noted that Bosch is the world's No.1 supplier of micro-electromechanical sensors, with €1bn in sales.

Comparing and contrasting materials, Roelver in his **Graphene Week** presentation showed that the worst case graphene scenarios roughly match a silicon reference. In the best case scenario, the result is a huge improvement over silicon, with much lower source current and power requirements for a given Hall sensitivity. In short, graphene provides for a high-performance magnetic sensor with low power and footprint requirements.

Contact: www.bosch-home.co.uk – www.fkf.mpg.de

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Liverpool ChiroChem wins top prize in Merseyside Innovation Awards

Beating fellow finalists **Fusion Implants** and **FumeCare**, the company will now receive £10,000 in cash and the two runners-up will share £4,000 worth of specialist business support. Liverpool ChiroChem (LCC) was founded in 2014 by **Professor Jianliang Xiao** of the **University of Liverpool**, along with former PhD students **Dr Jianjun Wu**, **Dr Paul Colbon** and **Dr Jiwu Ruan**. The business supplies specialist building blocks for pharmaceutical research and biotechnology and draws upon synthetic methods in asymmetric catalysis, first developed and patented by the university. This licensed technology has allowed LCC to develop a line of products using a simple, low cost and environmentally friendly process.

The company is now focusing upon the production and supply of chiral piperidines, said to be well known and ubiquitous building blocks utilised in the synthesis of many naturally occurring products, pharmaceuticals and fine chemicals. The location of LCC's analytical centre and scale-up laboratory in **Taizhou, Jiangsu, China** allows it to access to a network of quality assured suppliers in Asia.

Contact: www.liverpoolchirochem.com

Mercury Centre at the University of Sheffield harnesses Metalysis' technology

Metalysis holds the worldwide exploitation rights to the **FCC Cambridge process** which sees specialist powder metals created in a simple, cost effective process with significant environmental benefits.

Metalysis, the Rotherham-based technology innovator for the speciality metals industry, has seen its low-cost titanium powder used to 3D print automotive and jet engine parts in the Mercury Centre at the **University of Sheffield**.

Metalysis holds the worldwide exploitation rights to the FCC Cambridge process which sees specialist powder metals created in a simple, cost effective process with significant environmental benefits.

The company is in the process of commercialising the technology to produce titanium, tantalum, and related high value alloys. These are used increasingly by major worldwide industries such as aerospace, marine, medical, chemical, automotive and electronics.

Reports in *The Financial Times* suggested that Metalysis are in talks with commercial partners to build a \$500m titanium industrial plant to use its new process of making low-cost titanium powder.

The investor- and grant-backed **Cambridge University** spinout has developed the electrochemical reduction process to transform metal oxides, such as ores, directly into metal powders in a single step. Currently focusing on titanium and tantalum, the process uses less energy than traditional processes as it does not require the melting of metals, and the salt used in producing the metals can be recycled.

Contact: www.metalysis.com

SME NEWS – BIOTECH, PHARMA & MEDICAL SCIENCES

Insect control pioneer Oxitec Ltd snapped up by US firm Intrexon Corporation

Oxitec's shareholders will receive approximately \$80 million in Intrexon common stock and \$80 million in cash. Finalisation of the transaction, anticipated in the second half of 2015, is subject to customary closing conditions.

Oxitec controls mosquitoes that spread disease and to limit pest-related crop damage.

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Utilizing advanced genetics and molecular biology, it developed a new and innovative solution to controlling insect populations through the production of 'sterile', self-limiting insects whose offspring do not survive.

Unlike conventional approaches to insect control using insecticides that can affect the broader ecosystem, Oxitec programs are exquisitely directed at a single species. Intrexon intends to integrate its synthetic biology platform to advance Oxitec's existing initiatives to protect communities from diseases like dengue fever as well as against agricultural pests that impact food supply worldwide.

Intrexon's CEO **Randal Kirk** said "Oxitec's technology demonstrates that engineered biology can solve some of mankind's most difficult problems – many that have eluded solutions for a very long time – while exercising tremendous respect for the environment. In particular, to be able to induce a population decline in a major disease vector and know your intervention does not propagate in the environment is an historic achievement."

Hadyn Parry, CEO of Oxitec. "We look forward to making a difference in people's lives that much sooner as part of Intrexon." Dengue is the world's fastest growing mosquito-borne disease spread by the *Aedes aegypti* mosquito. A recent estimate indicates a potential 390 million dengue infections per year, of which 96 million manifest clinically.

Intrexon will work on furthering Oxitec's technology applications in agriculture as an estimated 20% to 40% of food production is lost every year to insect pests despite widespread pesticide use.

Contact: Chris Creese: 01235 832 393 – info@oxitec.com

Silicon Valley Bank thrusts £7m into Oxford BioTherapeutics coffers

The company secured a \$10m capital term loan from Silicon Valley Bank to accelerate the expansion of its research and development efforts. OBT is an international clinical stage biotechnology company focused on developing innovative antibody based therapeutics, including antibody-drug conjugates, to treat cancer and other diseases.

OBT uses the optimal combination of technologies in ADC development through its collaborations with leading companies in the field and its novel OGAP target discovery system – one of the largest of its kind in the world – to provide a unique range of validated, novel antigen targets.

Christian Rohlf, CEO of Oxford BioTherapeutics, said: "This additional financial support will enable Oxford BioTherapeutics to accelerate the development of our medicines. With a long history of supporting life science businesses, Silicon Valley Bank is a valuable partner that recognises Oxford BioTherapeutics' ability to transform the treatment of cancer and other diseases in an innovative way."

Nooman Haque, director of UK life sciences and healthcare for Silicon Valley Bank, added: "Silicon Valley Bank is working alongside leading UK life science businesses, like Oxford BioTherapeutics, to provide financial solutions that support this sector's ambitions to bring innovative therapies to the market." The financing will provide \$10m in capital, with \$5m being funded immediately. The debt will complement new equity the company is raising.

Contact: www.oxfordbiotherapeutics.com

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Queen's University Belfast spinout ProAxis launches immunoassay kit product

The firm's 'first-in-class' ProteaseTag immunoassay kits to research labs has been sold to two customers, including a major pharma company. **ProAxis** is developing a range of products for the capture, detection and measurement of active protease biomarkers of diseases.

This test measures Neutrophil Elastase, a leading indicator of infection in patients with Cystic Fibrosis and Chronic Obstructive Pulmonary Disease and an important drug target. The rapid and easy-to-use tests incorporate patented ProteaseTags; smart molecules which trap an active protease within a complex biological sample and enable a visual readout of its presence.

ProteaseTags provide a unique tool to identify and quantify active protease biomarkers and will assist in the clinical validation of new therapeutics. ProAxis is one of **NetScientific plc's** five core portfolio companies that it highlighted at the time of its full year results in March. The biomedical and healthcare technology group began investing in the company in February 2014 to further develop and commercialise its range of novel medical diagnostic tests. Now, with the launch of its first-in-class immunoassay kit, ProAxis will focus on building its academic and pharma customer base and developing other products for different indications.

In August 2015 ProAxis had a successful BIO exhibition in Philadelphia. CEO **Dr Lorraine Martin** and co-founder **Professor Brian Walker** met with a number of research groups and pharmaceutical companies who showed interest in the company's latest product – the proprietary first-in-class ProteaseTag activity dependent immunoassay.

ProAxis was in Philadelphia as part of the **Invest Northern Ireland (INI)** delegation. Over the 4 days the ProAxis team were kept busy with discussions ranging from interest in their new ProteaseTag product, for the specific detection of active neutrophil elastase in clinical samples through to co-development and licencing opportunities.

Contact: www.proaxis.com

Biotherapeutics firm Puridify wins Innovate UK Smart Award

Oliver Hardick is co-founder of Puridify, a company that has received funding and other support from Innovate UK to develop a novel technology, **FibroSelect**. It uses nanomaterial for advanced filtration of enzymes.

Enzymes and proteins are becoming more and more important in the fight against cancer and other diseases. Demand for **biotherapeutics** has grown a hundredfold over the last 20 years yet manufacturing methods are still geared to small-scale production, which limits their availability.

By speeding up production and reducing unit costs from the current \$300-1,000 per gram, it could save drug companies between £700,000 and £2.7 million per batch. Oliver said "We use the same principle of chromatographic separation to capture proteins and filter them. However our process uses a 3D nanofibre rather than the highly porous beads currently used. It's 10 times more efficient, and could reduce production costs by 25%.

"The commercial opportunities are considerable. The \$5.2 billion global chromatography reagent market has grown at around 14% annually for the last 5 years and is forecast to reach \$12 billion in 2017." In 2013 Puridify received a £100,000 **Smart award** from **Innovate UK** to develop their technology and to overcome technical and logistical hurdles.

Contact: www.puridify.com

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PhoreMost Ltd receives £1.4m from Innovate UK to develop oncology research

The company is focused on increasing the diversity and affordability of novel therapeutics. Based on PhoreMost's **Protein Interference** technology, the company has developed 'Site-Seeker', a next-generation phenotypic screening platform that can identify the best new targets for drug development and, crucially, how to drug them. PhoreMost's lead therapeutic programme has identified drug candidates to a novel synthetic-lethal target for KRAS. The **Innovate UK** funding will support development of this programme through phases of lead optimisation and candidate selection, with a longer aim to create a drug that may be tested in human clinical trials.

Dr Chris Torrance, CEO of PhoreMost said "The expert reviews conducted by Innovate UK provide independent, competitive validation of our lead programme development strategy, and the award funds will support our business aims to create novel therapies for cancer patients who have limited treatment options."

KRAS is one of the most commonly mutated genes in cancer: it drives disease initiation and progression, and is frequently a secondary event in 'acquired' resistance to new targeted therapies. However, **KRAS** mutant cancers remain largely unaffected by the development of new targeted therapies. Each year, cancers with RAS mutations account for approximately 25,000 deaths in the UK and 120,000 in the US.

Contact: www.phoremmost.com

Does a Cumbrian company hold 'the secret' to World Cup success?

It offers hi-tech healing – and it was helping England in their bid to win the **Rugby World Cup**. Big-name players, including Bath's former rugby league star Sam Burgess, have taken advantage of the technology on offer from Cryopod, who offer whole-body cryotherapy treatments.

In 2015 **Cryopod Ltd** introduced the 'world's first' air-cooled LiN (Liquid Nitrogen) cryotherapy chamber and **Karl Benn**, who works as a whole-body cryotherapist at Cryopod – whose headquarters are in Bootle, but whose manufacturing facility is in **Barrow** – believes the treatment can provide an advantage for the England players.

Mr Benn said the treatment has no risks. "Cryotherapy might be relatively new to sport, but it's been used to treat patients with diseases such as arthritis for decades," said the former Millom and Furness RUFC player. There is absolutely no risk attached at all and if we can help sportsmen and women recover from their injuries faster, it has to be a positive thing."

Cryopod have been brought in by the host nation to give them the best preparation possible for the big event. The company have previously worked with double Olympic champion **Mo Farah**, Super League side **St Helens** and **Newcastle Falcons RUFC** and have now turned their attentions to England, who opened their tournament against Fiji with a win at Twickenham last night.

Cryotherapy is primarily used to help treat inflammatory diseases and sees the whole body exposed to very cold air in special temperature-controlled cryochambers.

Mr Benn said "The therapy has three main positive effects on rugby players," said Mr Benn, whose arm was visible on a tweet posted by Mr Burgess. We can use it to help players suffering from muscle soreness and it's proven that it improves recovery time on injuries like fractures. There's also evidence that if a person uses cryotherapy, it also helps improve how well they sleep, which could be crucial the night before match days."

Contact: www.cryopod.com

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Edinburgh’s latest mobile app business Mallzee raises £2.5 million

As one of **Scotland’s** growing crop of mobile app businesses Mallzee produces a mobile shopping application – and secured major new backer **Royal Mail Group** as part of the deal. Other new and existing investors – including the **Scottish Investment Bank**, **Par Equity** and Skyscanner’s **Gareth Williams** – also gave fresh funds.

Founded in 2013 by **Cally Russell**, Mallzee gives users access to more than 100 fashion stores at a single go, while also allowing shoppers to build their own “style feeds”. Roughly three-quarters of its estimated 300,000 users are based in the UK, with the new money to expand that user base to one million by the end of the year. The deal took a couple of months to put together and gives the business a “significantly higher” valuation than the £75,000 Dragons’ Den offer Russell walked away from earlier this year.

The 27-year-old said the mix of investors will allow Mallzee to become ‘the leading fashion shopping app in the world’. New backers such as tech veteran **Chris Van Der Kuyl** and **4J Studios’ Paddy Burns** are experienced in scaling up global businesses, while Royal Mail’s role in online shopping will allow the company to access new retailers. Russell said “It is one of those kind of deals that makes fantastic sense once you get into it.”

Royal Mail, which acquired e-commerce software specialist **StoreFeeder** in February, said the Mallzee investment is part of its “continued focus on digital innovation”. More than a third of UK online shoppers used a mobile device to make a purchase during the past three months, with shopping the fastest-growing app category.

Nick Landon, MD of Royal Mail Parcels, said the deal will augment existing services while also providing “high-growth revenue streams further up the value chain”

Landon will take a seat on the board of Mallzee as part of the agreement, signalling Royal Mail’s status as the company’s largest single external shareholder. Russell and his management team still control more than 50 per cent, with the rest distributed among investors who to date have stumped up a total of £3.1m.

Mallzee takes a small commission from each sale and charges retailers to be featured on the app. Revenues are running in the “hundreds of thousands”, with Russell predicting break-even or profit by the second quarter next year.

Growth will lead to a doubling in headcount, which should reach 30 by year end. Expansion ambitions will focus on marketing in the UK, as well as targeting key regions internationally. “The US is the most logical one just now, but we are examining other markets as well and zeroing in on one or two,” he said.

Mallzee’s current main value-add to the Tinderface is to incorporate a social sharing component that lets users share an item they intend to buy with friends, who can then vote it up or down. If friends give the thumbs down the user is actively prohibited from making a fashion faux pas as a negative vote disables the app’s buy button. That twist could prove virally sticky for a younger demographic. Or just a bit annoying. Time will tell.

Contact: www.mallzee.com

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Edtech company RefMe voted 'Britain's best mobile startup'

RefMe is a free web and mobile tool that can be used to generate citations, reference lists and bibliographies. Back in March 2015 RefMe, an edtech company based in London, was voted as Britain's best mobile startup by **KPMG** and **UKTI**. The company, which allows students generate citations, reference lists and bibliographies with its free mobile and web tool, was awarded the prize at **Mobile World Congress** in Barcelona after judges evaluated a selection of finalists based on their traction/user base, revenue growth and innovation.

RefMe claims to have gained 500,000 users in eight months, overtaking **Spotify** and **eBay** in the download charts and growing faster than **Twitter** and **Pinterest** did in their first years.

The app allows students and academics to reference their work in the style of their choice by scanning a barcode on a book or journal, copying a pasting a hyperlink or searching for the publication manually. This data is then saved and synced in the cloud so it can be accessed across multiple devices.

RefMe CEO **Tom Hatton** said "We're over the moon," Hatton said. "It's an amazing feeling to see the technology you've worked so hard to build, be used by so many people, in such a short amount of time."

In 2014 Hatton said he had a million ideas that he wanted to pursue before settling on RefMe. The entrepreneur claims he was the first person ever to deliver a takeaway using a drone – something he did through his last company.

The competition finalists included:

- **Babylon Health** – www.babylonhealth.com
Integrated digital healthcare service in your pocket.
- **Stylect** – www.stylectapp.com
Tinder for women's shoes.
- **Verticly** – www.corporate.verticly.com
An online to offline platform that connects brands and retailers one-to-one to mobile consumers from any advert to instore purchase.
- **Moni Technologies** – www.moni.to
Mobile money transfer platform that enables its users to transfer funds from their bank account directly into that of a recipient.
- **Braci** – www.braci.co
A smart ear that listens to the sounds around you and turns sounds into visual and sensory alerts.

Contact: www.refme.com

SETsquared company ClusterHQ agree an £8m funding

The round was led by **Accel Partners**, with **Canaan Partners** and existing investors.

ClusterHQ will use the funds to expand technical and go-to-market resources to help organisations use container technology in production. The funding represents the largest Series A investment in the container ecosystem to date.

ClusterHQ is a software company 'at the heart of the container-based virtualisation revolution that is shaking up enterprise IT'. Most businesses nowadays, whether they are tiny startups or big established

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enterprises, have to be able to build and run software faster in order to not get left behind by their competition. Speed is not a choice, it is an imperative.

The reason that the **Docker** container platform, the most popular way of using container-based virtualization, is taking off like nothing enterprise software has ever seen before is that containers enable companies to build higher quality software, faster. Because of this monumental shift in development, container growth is exploding. One measure of this growth is that Docker's container platform went from under 3 million downloads in June 2014 to 67 million in November 2014.

But there is a problem. Containers don't handle data very well. This means that databases, the heart of every application, can't run in containers without significant engineering resources. ClusterHQ's mission is to make it possible for companies of all sizes to run their mission-critical data services inside containers.

Contact: www.clusterhq.com

Darktrace raised \$22.5m in funding from equity investor Summit Partners

Darktrace's **Enterprise Immune System** represents a new class of 'cyber defence' software that helps enterprises and government bodies protect themselves against advanced attacks and data compromises from within the network.

The firm, which has **Autonomy** founder **Dr Mike Lynch** OBE as one of its directors, analyses network activity and 'learns' the behaviour of every device, user and network within an organization in order to detect abnormal threat behaviours as they emerge. Darktrace is currently experiencing exceptional bookings and revenue growth driven by rapid geographical expansion and a significant increase in its customer base.

Darktrace is reinventing the way organizations protect their data and assets, developed by some of the leading minds in machine learning and mathematics.

CEO of Darktrace **Nicole Egan** said "This is yet another validation of our machine-learning and mathematics approach, and will enable us to maintain a fast pace of innovation, and pursue our vision of bringing the Enterprise Immune System to the heart of cyber defense strategies today."

The funding will help Darktrace meet international demand, particularly in the **US** and **Asia Pacific**. In addition, Darktrace will continue to scale the business and hire world-class talent for its technology, cyber analyst and commercial teams around the world.

Contact: www.darktrace.com

FUNDING & INVESTMENTS

Crowdfunding platform Crowdcube secures £6m of investment to accelerate growth

Crowdcube already has an investor community of around 200,000 and employs 70 people across offices in **London**, **Barcelona** and **Exeter**. Since its launch in 2011 more than £100m has been successfully invested on the platform.

The latest investment will be put towards further recruitment, improving its current offering and adding to its suite of services – including the new IPO provision. Lead investor **Numis**, which has raised £10bn for businesses since 2009 through more than 46 IPOs, will work with Crowdcube and the regulators.

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Their primary aim will be to enable large high-growth businesses who are 'going public' by listing shares on the London Stock Exchange's Main Market or AIM, to access individual investors.

Numis founder and CEO **Oliver Hemsley** praised Crowdcube for creating "an impressive business model and technology platform". He said "Numis has a long track record of helping companies access funding for growth and this investment in Crowdcube will put it at the centre of the entire investment chain, from initial start-up capital all the way to IPO."

Crowdcube CEO and co-founder **Darren Westlake** added that the business is "on a mission to help more businesses raise the finance they need to grow, create jobs and deliver returns to investors".

Contact: www.crowdcube.com

Aldermore plc becomes 'second largest net lender to SMEs' in UK

With an IPO under its belt this year, and a balance sheet worth more than £5bn, the former challenger bank is providing much needed diversification in the British banking landscape.

During the first quarter of the year, Aldermore was the second largest net lender to SMEs participating in the **Bank of England's Funding For Lending Scheme**, second only to **Lloyds Bank**.

The decision to position **Aldermore** as the champion of British SMEs, homeowners and savers paid off in 2011 as the bank broke even for the first time, two months ahead of forecast. The digitally-orientated bank has two of its 11 offices based in the north west, creating a 260 strong workforce in the region.

With a Manchester-based invoice finance hub and residential mortgage division based in Wilmslow, the city region is important to the overall Aldermore offering. The bank has grown from very meagre beginnings with just 30 people and £50m of assets to nearly 900 people and over 160,000 customers.

Contact: www.aldermore.co.uk

Cambridge Quantum Computing Ltd wins 'significant' Italian investment

In August 2015 **Grupo Arcano** invested in Cambridge Quantum Computing (CQCL). Although undisclosed, for a 'reported \$50m'.

Established in early 2013 CQCL was founded to create tools and algorithms for the commercialisation of quantum computers. It has an operating system called ' qket ' and is focusing on field including cryptography, financial services, medicine, biotech, and big data.

CQCL stated "After just over two years of being self-funded, the technology investing company Grupo Arcano invested in and has become an important shareholder of CQCL. The amount of the investment and the percentage ownership owned by Grupo Arcano is confidential and is not disclosed."

It added "The funding allows CQCL to accelerate and build on its position as the world's leading independent quantum computing company with a focus on developing a quantum Operating System including a platform for developing a quantum processor, and on related algorithms and software."

Contact: www.cambridgequantum.com

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LumeJet Ltd falls into administration in spite of earlier promise

In late August business advisory firm **Cooper Parry** were appointed as administrators of the digital printing machine and printhead manufacturer. The administrators are currently seeking offers for substantially the whole of the **Coventry**-based firm's business and assets.

Privately funded LumeJet, which was founded in 2010, develops photonic platform technology for inkless printing and patterning applications. Key features of the company for sale include a team of 10 individuals, five printers in stock, two in build and significant customer interest in the UK and Europe, as well as assets including patents and trading company assets stock and plant.

The company is also said to be in a development phase for UV printheads for 'maskless' patterning and PhotoInk technology for high-speed labelling and packaging. It was 'anticipating future revenue of around £15m per annum'.

The administrators claimed the company had sold four of its flagship **LumeJet S200** photonic digital printers to date, although *PrintWeek* had reported six sales of the device, to London-based **Clicks**, which bought two, **Barnard & Westwood**, **Altaimage** and **TG Print & Design** and Darlington-based **Sense Creative**.

The £150,000 S200 can be used to produce pitch books, fine art prints, photobooks and personal publishing. The inkless technology features LumeJet's patented Digital Print Head (DPH), and works in a similar way to an inkjet using light, rather than ink, to make tiny dots on photosensitive media.

In 2014 the business became the first crowd-funded digital machine and printhead manufacturer after it launched a funding project on the CrowdBnk platform. Its investment target was £1.47m and £1.5m was raised through the platform.

Ominously in 2014 the firm presented at Buckingham Palace and 10 Downing Street, when it was selected as one of the 10 most promising digital companies in Britain.

Contact: www.lumejet.com

UNIVERSITY NEWS

University of Dundee entrepreneur puts UAV through 120km journey

The wonderfully named **Triantafyllos Gkikopoulos** is a University of Dundee-based entrepreneur who is aiming to set a new world record for the longest flight of a hydrogen fuel cell-powered UAV.

Mr Gkikopoulos, a researcher in Life Sciences, has designed and built an unmanned air vehicle that will be powered by a hydrogen fuel cell.

'Trias' came to Dundee in 2003 to do a PhD, studying chromatin remodelling in vivo. While some times you can find him in the lab, he is most occasionally to be found on the Scottish hills.

Contact: t.gkikopoulos@dundee.ac.uk

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Two UCL professors awarded the UCLB One to Watch Award

Professors Tony Kenyon and **Dr Adnam Mehonic** worked on the development of a new type of non-volatile computer memory, Resistive Random Access Memory (RRAM) which is faster and more efficient than current Flash memory. **RRAM** is a promising and potentially disruptive concept for future computer memories.

The UCL RRAM is directly compatible with the fabrication processes used in semiconductor fabrication of microelectronic devices (CMOS) enabling integration with the next generation of microprocessors which will power high-speed and efficient devices in the consumer electronics, automotive industry, and medical device markets.

The team's focus is now on receiving the latest generation of **UCL RRAM** memory arrays, currently being fabricated at **Sematech's** state of the art fabrication facilities. The delivery of these devices will allow the team to cross a major milestone on the route towards commercialisation of their research. The devices under fabrication will provide further data on compatibility with standard semiconductor fabrication practice, yield, reproducibility and switching regimes.

The fabrication of the RRAM memory arrays was facilitated and supported by UCLB through **Proof of Concept** funding. UCLB has also filed patents covering this technology, as well as setting up a commercialisation strategy and engaging with the semiconductor industry.

Contact: www.ee.ucl.ac.uk/~tkenyo

University of Warwick develops Q-Eye – a novel type of sensor

Professors Evan Parker and **Terry Whall**, at the Nano-Silicon Group in the university's **Physics Department**, have devised a new type of sensor that 'is much faster than competing technologies used to detect and identify hidden objects'.

Called Q-Eye, the invention senses radiation across the spectrum between microwaves and infra-red, known as the terahertz (THz) region of the spectrum, a goal that has challenged scientists for over 30 years. It works by detecting the rise in temperature produced when electromagnetic radiation emitted by an object is absorbed by the Q-Eye sensor, even down to the level of very small packets of quantum energy (a single photon).

A new type of sensor, which is much faster than competing technologies used to detect and identify hidden objects, has been developed by scientists at the University of Warwick.

Warwick Ventures, Warwick's technology transfer business, has helped the professors to create a spinout company, **Q-Eye Ltd**, to develop and market the technology. **Phil O'Donovan**, Warwick alumnus and a Cambridge-based business angel, are working with the academics to build the commercial team, secure commercial partners and raise funding to develop the first commercial prototypes.

The global market for devices that operate in the THz region is growing at around 26 percent year on year, so Q-Eye is well placed to support the UK's strategic lead in the sector. A longer term opportunity lies in quantum computing, set to revolutionize the way we handle and encrypt data.

The team has also been awarded a £100,000 **Smart Award**. The work is moving out of academic research into the commercial world, offering opportunities for partnership and investment. Companies involved in the personnel screening market have already expressed interest in the Q-Eye device.

Contact: www.warwick.ac.uk/fac/sci/physics/research/condensedmatt/silicon

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University of Sheffield links with MedImmune to create 'cell factory'

MedImmune, the biologics R&D arm of **AstraZeneca**, and the University of Sheffield entered into a multi-project research collaboration to generate breakthrough research in cell factory processes, the means by which living cells can be controlled and manipulated to make specific proteins with therapeutic benefits.

The university's **Advanced Biomanufacturing Centre** will advance research specifically in mammalian cell factories. Researchers will exchange research materials and move easily between sites and state-of-the-art facilities and will work closely as an integrated team. A Joint Steering Committee (JSC) comprised of equal members from both institutions will select the research projects and may choose to seek additional grant funding from other sources to generate further high quality, collaborative work.

Gail Wasserman, Senior VP at MedImmune, said "This multi-year commitment provides MedImmune with a strong partner in cell factory research and may allow select complex proteins to be more rapidly and effectively manufactured to produce life-changing therapies."

Professor David James, Director of the Advanced Biomanufacturing Centre at the University of Sheffield. "Together we will design and create new cell factories specifically fit for purpose that can overcome natural limitations in cellular manufacturing performance."

Contact: www.shef.ac.uk/chelsi/biomanufacturing

University of Manchester to open 'Graphene Engineering Innovation Centre'

As if the university has not received enough cash already for its graphene services, a £60m **Graphene Engineering Innovation Centre** at the University of Manchester will 'set the standard' for showing the best use of the new wonder material.

Along with the £61m **National Graphene Institute**, which opened in mid-2014 and the planned £235m **Sir Henry Royce Institute for Materials Research and Innovation**, the industry-led centre will be the most expensive layout to date.

Shirking local architects the building will be designed by 'world-renowned' architect **Rafael Viñoly**. Some 8,400 square metres in size, it could open as early as 2017. The centre will also have pilot production facilities and will allow research into other materials.

The university has more than 230 experts working on the material. Their staff is already exploring the potential for bendy phones, tablets and TVs, made from graphene. They say the material could revolutionise the manufacturing of electronic devices.

Deputy VC **Professor Colin Bailey** said: "The centre will be crucial to take graphene to the market and address issues such as scale-up and infrastructure. Alongside the university's existing world-class facilities in graphene and advanced materials, the centre is essential to maintain the UK's international leadership position in this area and ensure effective commercialisation of a UK discovery."

The centre will be partially funded by £15m from the Higher Education Funding Council England's UK Research Partnership Investment Fund; £5m from Innovate UK; and £30m from **Masdar** – the **Abu Dhabi** based renewable energy company owned by **Mubadala**. Manchester has been named *European City of Science* for 2016 – a first for the UK.

Contact: www.graphene.manchester.ac.uk

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University of Chester joins two US firms to enter the Longitude Prize contest

TeamCMI, the university's entrant, brings together two small companies from the US – **Conceptual MindWorks** and **BioAnalysis Consulting** – and the University of Chester in the UK.

TeamCMI is the first group formed specifically to enter the prize. Two other promising applicants are from the US: Spectral Platforms, a small Californian company, and Alere, a larger diagnostic company based in Massachusetts but with a UK research presence. A fourth submission comes from ArcDia of Finland. The teams are using various technologies, including spectroscopy, immunology and DNA recognition, to distinguish between different pathogens.

The winning test must be portable and easy to use anywhere in the world with minimal training, give an accurate result within 30 minutes, and be affordable by everyone who needs it — particularly in poorer countries where resistance is growing fastest.

The panel's co-chairman **Peter Piot**, director of the **London School of Hygiene & Tropical Medicine**, said the first round of submissions fell short of the winning post in various ways.

"Some applications used the identification of different 'biomarkers' [naturally occurring characteristics] to detect when an infection requiring antibiotic treatment was present," said Mr Piot. "However, some could not provide a result to the patient within 30 minutes. Other teams proposed completely novel technologies but their ideas were not sufficiently advanced to validate the test's performance."

None combined affordability and ease of use. "The applications we saw, although good, were not yet good enough to make the global impact we hope for," adds Piot.

The prize focuses on one important part of the problem: how to identify the germs causing a disease. In many cases doctors cannot tell quickly even whether symptoms are caused by an infectious organism, let alone whether the pathogen is a bacterium susceptible to antibiotic treatment rather than a virus or a drug-resistant bacterium. As a result they prescribe antibiotics too often, just in case a susceptible bacterium is responsible. This overuse stimulates the evolution of drug resistance.

Contact: www.chester.ac.uk – www.spectralplatforms.com

University of York gains £18m Digital Creativity Hub

The Hub aims to 'spark a revolution' by harnessing cutting edge research in digital games and interactive media to benefit society. **Chancellor George Osborne** announced the centre in the recent Budget. The hub is one of a network of six new multidisciplinary research centres, worth a total of £45 million with partner contributions, to help the UK's digital economy research, knowledge and skills

The DC Hub will harness the power of digital creativity to provide new technologies for digital games and interactive media, exploiting the space where they converge to benefit science, society, education and culture.

The co-directors are **Professor Peter Cowling**, from the **Department of Computer Science** and **Professor Marian Ursu** of the **Department of Theatre Film and Television**.

Professor Cowling said: "The potential of the digital creativity is enormously exciting. We shall engage with partner organisations to develop of proof-of-principle, market-led projects based both on current research and applied research shaped and undertaken with industry partners."

Professor Ursu added: "We already have over 80 partners within the DC Hub, and we anticipate the

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partner base will grow to ensure we generate substantial economic, social and cultural impact.”

The DC Hub will employ 15 of the best impact-driven digital creativity researchers in the world at levels from Professorial to post-doctoral to transfer knowledge and expertise gained from the £90 million of investment in Digital Creativity Research at York and **Falmouth University, Goldsmiths (University of London)** and **Cass Business School** over the last 10 years.

Contact: Dept of Computer Science, University of York – www.cs.york.ac.uk

AND FINALLY...

>> Low-cost IT workers in India are populating what have been described as ‘click farms’ in fake internet traffic to help British companies boost their online presence, according to a media report. An investigation by The Times newspaper found that western companies are being offered packages costing as little as \$1 per 1,000 clicks to increase internet traffic or purchase 1,000 to 10,000 **Facebook** “likes” or **Twitter** followers.

Navdeep Sharma, whose company **Indian Facebook Likes** specialises in what he calls “social media optimisation”, told the newspaper that most of his clients were American or British corporates.

David Sendroff, the chief executive of **Forensiq**, a US company that specialises in identifying fake internet traffic on behalf of advertisers, estimated that the market for false traffic was worth up to \$600 million per year and was growing at 20 per cent per year. “These click farms are generally coming out of places where labour is very cheap – **India, Vietnam, Bangladesh**. The real victims are the advertisers who end up buying space,” Sendroff said.

>> **Croydon** to get its first 20mph zone after ‘1.5% of people in north tip of borough vote yes’. Despite criticism that hardly anyone took part – streets in parts of South Norwood, Selhurst, Bensham Manor, Thornton Heath and Upper Norwood will get the reduced speed limit it was announced at a Croydon Council cabinet meeting. At the cabinet meeting it was revealed only 2,320 people had voted in the first referendum, out of the approximately 90,000 people who live in the area.

>> **Dog owners** across the county must have their pets **micro-chipped** by April 2016, under new rules. Government guidelines stipulate all dogs must be taken to the vet to be chipped by the Spring and any new dogs bought after have eight weeks to be registered on one of six dog databases.

It is thought the rules could help reunite lost or stolen dogs with owners, deter thieves from stealing dogs, enforce lifelong responsibility on people who farm puppies and make it easier for vets to get in touch with owners during emergency situations. Dog owners who ignore the new rules will face prosecution and a fine of £500 could be handed out.

>> Some 15 years ago wine connoisseurs across the world were turning their noses up at English wines. But after years of heavy investment **Hampshire wine** has grown from being a cottage industry to one worth tens of millions of pounds with 38 vineyards operating across the county with more planted every year. The region helped the country to produce 6.3 million bottles of wine last year with sales of English wine predicted to make £100 million this year. Many of the county’s vineyards produce sparkling wine, which in some tests is beating those from previous winners in regions such as Champagne and Prosecco.

>> In the wake of the demise of **Kids Company** we at Gibson Index are feeling slightly pleased with ourselves. We warned a series of London member clubs and recommended they have nothing to do with it. After one, chaotically organised fund-raising event at **Home House** in London, Gibson Index informed

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management of the risks of getting involved. It wasn't repeated, and nearly all other clubs in London sensibly followed suit. Listeners to **BBC Radio 4** were first warned of the odd behaviour of its eccentric founder when she said that many of the 2011 London rioters 'were not wearing any knickers'. At the time we rang **Scotland Yard** press office to ask how many arrested rioters had been found 'knicker-less'. There was loud laughter at the other end...

Leader of **Southwark Council Peter John** summed up the organisation neatly. In 2015 he said the founder's claims and language used were "pretty extraordinary". He said: "They claim to have 36,000 children they were dealing with, at the moment we have received for all of London details of 1,692 children, 330 of whom could be regarded as high risk." What happened to the millions of pounds the charity has spent?

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