£4m investment in EngineShed 2

The next phase of the EngineShed technology hub will see a £4m investment.

Bristol drives real world autonomous car development

Bristol is one of three key UK technology projects for driverless cars with the VENTURER project. Over £19m has been committed to the projects over the next two years.

Region shines at CES

Companies from the region have been demonstrating their expertise at the annual Consumer Electronics Show in Las Vegas, both in their own right and as part of the next generation of innovative products.

Upheaval in quantum R&D

Bristol lost out on the recent bid to host the UK's centre for Quantum Computing, but is teaming with two other centres in multimillion pound research projects and is planning a new Quantum facility.

Dec/Jan 2015

Blu Wireless builds a 60GHz network

Bristol chip designer Blu Wireless Technology is building its own 60GHz equipment to add to the terabit network about to be approved as part of Bristol is Open

Robotics innovation facility opens for SMEs

The world leading Bristol Robotics Lab is the lead centre for a £15m innovation programme to help small and medium sized companies accelerate the development of new hardware and software technology.

The High Tech News banner was developed by Nanoscope Services in Bristol which milled an image of the Clifton Suspension bridge just 8μm long onto the bond wire of a chip www.nanoscopeservices.com

Region's stars shine at CES

Multinationals such as Broadcom, NVIDIA and Infineon were all demonstrating the latest technology using expertise from the region, while home grown innovators such as Imagination Technologies, CSR, XMOS, Xsilon, Ultahaptics, Blue Wireless Technology and Open Bionics were all demonstrating and discussing their technologies with a global audience.

Broadcom's WiFi and set top box hardware and software are developed in the region and showcased in the latest chips. Infineon supplies the TriCore engine controller, designed and supported in Bristol, to over a third of all the cars in the world, including BMW which was showing the latest autonomous, self driving cars at the show. NVIDIA launched its latest multicore processor, the Tegra X1, which will be used in automotive entertainment and systems controllers alongside the wireless modem technology it develops in Bristol. Imagination Technologies' PowerVR, MIPS and WiFi technology was also in many smartphones and tablets across the show.

The latest controller chips from XMOS were on show in audio systems from Sony such as the high end PHA family of headphones and systems from Meridian, OPPO and Sennheiser using their latest Multi-Function Audio (MFA) platfrom, while Ultrahaptics was demonstrating its free space interface (see below). Meanwhile Xsilon took the opportunity to start an early adopter programme for its Hanadu machine-to-machine communications protocol and chips and Blue Wireless Technology was holding successful customer meetings for its 60GHz wireless technology, while robotics startup Open Bionics showed its open source, 3D printed artificial hand on Intel's booth.

EngineShed in £4m phase 2 expansion

The EngineShed technology centre is to receive around £4m for its phase two development as part of an £18m investment in the region announced at the end of January. This will potentially triple the space available as the centre is currently full.

The centre hosts the Bristol SETsquared Business Accelerator, as well as the WebStart incubator and is home to innovative technology startups such as Blu Wireless Technology, Ultrahaptics, Fusion Processing and Systems4Silicon. In the last 12 years SETsquared has developed over 1,000 high tech start-ups that have generated some £1bn in investment. It is named by the UBI as the joint best university incubator in Europe and 2nd best globally.

The Bristol SETsquared Centre supports over 65 members who between them employ over 750 people and have raised over £168m since 2007.

www.engine-shed.co.uk

Ultrahaptics expands its team

Ultrahaptics, the leading developer of ultrasonic free-space interface technology, has a new chief executive and chairman to follow its £600,000 seed investment in November last year.

Michael Tobin OBE has joined the company as Chairman, having taken his business from a market cap of £6m to Europe's leading Data Centre operator worth over £1.5bn. "Ultrahaptics has developed a unique offering that will revolutionise the gaming, automotive and gesture markets. Their technology literally completes virtual reality. To date virtual reality has allowed you to see and hear, but now the Ultrahaptics technology allows you to feel what you see!"

He joins new CEO Steve Cliffe who is commercialising the unique technology that enables users to receive tactile feedback without needing to wear or touch anything. The technology uses ultrasound to project sensations through the air and directly onto the user. Users can 'feel' touch-less buttons, get feedback for mid-air gestures or interact with virtual objects.

wwww.ultrahaptics.com

Open source TV group expands

DTVKit, the digital TV open software software supplier, has launched a new membership level for companies wanting to use more than silicon supplier.

Product Plus membership provides the opportunity for members to work with whichever silicon platform they choose, even if the vendor is not a DTVKit delivery member. The membership grants unlimited royalty free rights to use DTVKit software compiled to run on any silicon platform, and as with Product membership, unlimited access to the source code. This is based on the proven technology developed by Ocean Blue Software over the last ten years that is used in over 15 million of TVs and set top boxes around the world.

As an enhancement of 'Product' membership, existing members can also upgrade to 'Product Plus' at any time.

"Introducing a third level of membership means that we are able to offer a more flexible option to new and existing members," said Amy Cleary, Marketing and Operations manager at DTVKit. "Product Plus allows access not just to the suite of software components, but also enables members to commercially exploit them on any silicon platform. Having spent time listening to our members needs and expectations, we felt this introduction was a progressive step forward for the foundation's growth." Current members of DTVkit include global manufacturer Tatung Technology and OEM box makers such as Eagle Kingdom Technologies using source code from OBS. This formed the v1.0 release from DTVKit by way of perpetual, irrevocable royalty free licence.

www.DTVkit.org

Qualcomm to buy CSR

US chip design giant Qualcomm is to buy Cambridge Silicon Radio which has a design centre in Bristol with 15 staff. The $1.5bn deal is expected to close in the summer.

Qualcom develops multicore processor chips for portable applications and so competes with NVIDIA here. It also owns WiFi subsidiary Qualcomm Atheros which competes with Broadcom.

"The addition of CSR's technology leadership in Bluetooth, Bluetooth Smart and audio processing will strengthen Qualcomm's position in providing critical solutions that drive the rapid growth of the Internet of Everything, including business areas such as portable audio, automotive and wearable devices," said Steve Mollenkopf, chief executive officer of Qualcomm Incorporated. "We look forward to working with the innovative CSR team globally and further strengthening our technology presence in Cambridge and the UK.

www.qualcomm.com

TVS expands with Chinese avionics deal

Bristol-based verification expert TVS has won a key avionics hardware deal in China. The verification service project with TopBrain Design Systems helps Chinese equipment companies verify new avionics FPGA designs in compliance with DO-254 avionics standard.

The verification project service by TVS helps the leading company to verify its safety critical avionics FPGA designs. TVS will be applying advanced verification techniques such as constrained random verification, functional verification and assertion-based verification to the project. As required by DO-254 requirements traceability will be applied and TVS will use its unique asureSIGN technology to ensure that requirements can be traced to the verification data generated through the advanced verification techniques being applied.

"This deal confirms the strength of our partnership with TopBrain. There is a strong demand for advanced verification expertise in China and with more than 130 skilled engineers globally, TVS is well equipped to respond to those needs, and it makes perfect sense for TVS to collaborate with TopBrain," said Mike Bartley, CEO and founder of TVS. "There are also a number of additional avionics products being designed in China that all require DO-254 compliance where TVS has lots of expertise." As a result TVS and TopBrain are considering further DO254 projects in China and as part of its strategy in the country, TVS plans to open an office there in 2015 to strengthen and underpin its presence in the region.

www.tanvsolutions.com

Bristol drives real world autonomous car development

Bristol is at the heart of the development of autonomous vehicles, and the VENTURER consortium brings together Atkins, Bristol City Council, South Gloucestershire Council, AXA, Williams Advanced Engineering, Fusion Processing, Centre for Transport and Society, University of the West of England (UWE Bristol), University of Bristol and Bristol Robotics Laboratory, a collaboration between the University of Bristol and UWE Bristol. The aim is to test technologies for driverless vehicles in real world situations, looking at the insurance and public acceptance issues during 2015 and 16.

BRL has been researching both autonomous behaviours and public acceptance issues and hosts some of the world's leading researchers and will will customise the vehicle to make it suitable for urban transportation and equip the cars with sensing and video processing capabilities.

"The possibility of driverless cars running in city centres presents some important challenges for how we manage the interactions of people and vehicles," said Professor Graham Parkhurst, Director, Centre for Transport and Society at UWE. "Pedestrians will still want the freedom to cross the road where it suits them, but driverless cars will need to be able to make progress safely if they are to be effective. Driverless cars also have a large potential to change both our travel patterns, and what we do while we travel. Will travellers be able to read a book in urban traffic, or will they feel too travelsick? More people could travel by car if they don't need a licence themselves or someone to drive them. This could open up opportunities to people but might also mean more car traffic. On the other hand, cars driven automatically are expected to be more energy efficient than when driven by the typical human, and people might be more willing to share if nobody is taking the responsibility for the driving. So a key challenge is to understand how far driverless cars will be a good or bad development in environmental terms."

The University of Bristol's Communications Systems & Networks (CSN) group will develop wireless links that enable driverless vehicles to communicate with smart city infrastructure. Vehicles will also exchange sensory data via direct car-2-car wireless communication links. This will allow the sharing of hazard warnings and new "look ahead" functionality.

"We are thrilled to be appointed by Innovate UK to lead the UK development of an independent test site for, and a market leading capability in, autonomous vehicles," said Lee Woodcock, the VENTURER project lead and technology director for Atkins' Highways & Transportation business. "The VENTURER consortium have joined forces to explore the feasibility of driverless cars in the UK, by trialling autonomous vehicles in the Bristol region, investigating the legal and insurance aspects of driverless cars and exploring how the public react to such vehicles.

"This programme will help keep the UK at the forefront of this transformational technology, helping to deepen our understanding of the impact on road users and wider society and open up new opportunities for our economy and society," said Business Secretary, Vince Cable "The UK is a world-leader in the development of driverless technology, and today' announcement will see driverless cars take to city streets from 1 January. This not only puts us at the forefront of this transformational technology but it also opens up new opportunities for our economy and society. Through the government' industrial strategy we are backing the automotive sector as it goes from strength to strength. We are providing the right environment to give businesses the confidence to invest and create high skilled jobs."

There are two other projects on driverless systems, with a project in Greenwich, SE London, and a joint project in Milton Keynes and Coventry. The overall funding for all three is £19m.

The MK project is looking at the communication systems between cars and infrastructure (v2v and v2i) while the Greenwich project is looking at smaller, low speed autonomous systems (like Google's new 25mph driverless car) on private roads.

Autonomous vehicles have already been demonstrated at the CES show in Las Vegas in January, with an Audi driving itself 200 miles from San Francisco to the show and BMW showing cars that will slide themselves around a race track and also take themselves away and park in a multistory car park on their own. The Bristol project is very much about finding out how the technology will work in practice.

The Year ahead - 2015

January - Bristol Green Capital 2015 gets into full swing and the region's companies show their expertise at the Consumer Electronics Show in Las Vega. The High Tech sector group and the Science Park host a High Tech Education and Skills Immersion event.

February - Digital Bristol Week highlights the skills and expertise across high tech and creative, bringing together technology innovation, web technologies, broadcast and video. Mobile Worrld Congress in Barcelona, Spain, shows the region's wireless skills, while Embedded World in Nuremburg, Germany highlights the leading edge embedded electronics and robotics capabilities The 23rd Safety-critical Systems Symposium also makes its annual visit to Bristol and the Embedded Software SIG meets, as well as a debate on health technology. Virtual Reality experts gather for the SWVR conference in Bristol.

March - The Intelligent Testing Conference looks at the challenges of testing the latest embedded systems and software while the Education and Skills SIG meets.

April - Bristol is Open takes off with a terabit network capability and the High Performance Computing SIG meets.

May sees 30th anniversary of the Inmos Transputer and the health tech SIG meeting.

June - Venturefest 2015 highlights all the innovation in the region from Brunel's PassengerShed

July - Qualcomm's takeover of CSR expected to complete

September - the Multicore Challenge Conference brings the world's leading processor researches and develops to Bristol

October -

November - the Advanced Engineering show at the NEC in Birmingham covers flexible electronics and 3D printing

December - Bristol hands over as Green Capital to Ljubljana, capital of Slovenia

AVnu sets time sensitive industrial networking standard

Standards body Avnu has approved a version of its time sensitive networking protocol for industiral applications, extending the audio protocol that XMOS in Bristol ahs been championing with its controller chips.

"We believe that an open standard for time sensitive networking will be a key enabler for the future development of the industrial communications market, which is a key area of strength for XMOS," said the company. "As long as two years ago, we demonstrated a system that combines AVB with legacy communications protocols such as CANbus: a foundational TSN standard, defined through the AVnu Alliance, allows us to leverage these established capabilities of the xCORE architecture.

We were the first company to announce an Avnu-certified AVB audio endpoint reference platform; recently, we presented leading-edge developments, in collaboration with Daimler, that will enable implementation of AVB in automotive networks. We fully intend to extend our technology leadership with similar advancements in the industrial space, where we ready have a significant presence.

We'd also like to welcome Belden, General Electric and National Instruments to the AVnu fold. We believe that the participation of these leading names demonstrates the central role of TSN in the industrial market, and represents a significant endorsement for the AVnu Alliance"

www.xmos.com

Patent box hit by staged withdrawal of relief

The UK's Patent Box regime, which allows companies to pay just 10% tax on their intellectual property income, will close its lid to new entrants in June 2016. Existing participants will continue to enjoy the benefits until June 2021.

A new trade off between the UK and Germany to stop companies shifting their profits from one country to another to enjoy reduced tax will lead to a tightening of the scheme's rules. In particular, Patent Box will only be available to companies which have developed an invention in the UK.

Details of the revised scheme have not yet been made available, though the Treasury hopes to eventually simplify the rules for small and medium-sized companies. Inevitably, there will be a loss in the present fiscal advantages.

"With only 18 months left to jump in the existing box and enjoy the current tax benefits, companies looking to commercialise their patented innovations need to get a move on," said Nigel Warren, Tax Partner for Manufacturing, Technology and Innovation at business advisers Bishop Fleming.

Patent Box was first introduced in April 2013 to encourage innovation and to bring high value science and technology jobs and investments to the UK. It was also to ensure that the jobs that were already in the UK stayed here.

What is patent box?

Instead of paying the normal rate of tax, the Patent Box rate of 10% covers income derived from the licensing or selling of patent rights. This reduced rate is actually being phased in up to 2017 and is given by providing an additional deduction against tax. "As the present scheme is being phased in over a four-year period, it will have a relatively short life in its current guise," said Warren.

Companies that are part of a group may also be able to enjoy the reduced rate even where the development work was carried out by another group member.

To join Patent Box whilst it remains a company must hold qualifying intellectual property (IP) rights or hold an exclusive licence over such IP. The company must have created or significantly contributed to the creation of the IP or an item or process that incorporates the invention.

IP can include "items incorporating one or more qualifying items", so it does not need the entire product itself to be patented. So whilst computer software and algorithms, for example, cannot alone be patented, in practice there are many patents on a "whole" product which will include the software.

Indeed, the tax office acknowledge that where a device or system is designed to execute the software, that device or system can be considered to be an item incorporating a qualifying element. The company must hold a patent granted by the UK Intellectual Property Office, the European Patent Office or an equivalent other office in another part of the European Economic Area. "If the company doesn't currently hold a patent then it may wish to look at ways to come within the Patent Box regime to achieve the tax savings," he said.

Even better, the effect of claiming Patent Box can be retrospective under the current rules. Obtaining a patent in, say, 2016 that you filed in 2014 means that you can still claim for the patent-pending period once the patent is obtained.

Income that can be placed inside Patent Box can come from the sale of patented products or products which include the patented innovation or bespoke spare parts, licensing out or sale of patent rights, infringement income; and damages, insurance or other compensation related to patent rights.

Warren warns that the calculation is complex: "There are a few stages to go through in arriving at the profits subject to the lower tax rate," he explained. The reduced rate of tax is arrived at by subtracting an additional trading deduction from taxable profits. But before the deduction is calculated, the amount of profits that qualify for Patent Box must first be computed.

As the full benefit of the relief is being phased in, the effective rate of tax for small and medium-sized companies ivaries from 12.7% this yeat to 10% from 1 April 2017, and there are similar effective rates for larger companies. This means a company with Patent Box-attributable profits of £1,000 in the year to 31 March 2016 would only pay £120 in tax (12%) compared to the normal amount of £200 (at 20%).

R&D relief

A key issue is the interaction of Patent Box with the R&D tax regime, which is effectively the other side of the coin. Whilst R&D tax credits provide relief for innovative research and development, Patent Box provides relief for companies with products already developed.

"Businesses that use Patent Box are also likely to be involved in research and development qualifying for R&D tax credits," commented Mr Warren. "The two regimes complement each other so companies can take advantage of both," he added. At the present time there appears to be no risk to the continuance of the current R&D tax credit regime. It does not appear to have been affected by the agreement.

http://bishopfleming.co.uk/service/patent-box-3/

Blu Wireless builds out its 60GHz plans

Back from successful meetings at the Consumer Electronics Show and tagged as one of the top ten companies to watch in 2015, Blu Wireless is now rolling out a test network across Bristol for its high speed 60GHz wireless links.

"We are growing very quickly, 26 engineers right now and aggressively recruiting for good wireless software and system on chip engineers right now,"said Mark Barrett, chief marketing officer. "The reason we are expanding is on the back of using 60GHz for applications in the backhaul marketplace and recently signed a contract with an operator with a $3.5m investment. It means we are developing a complete system including a sophisticated baseband modem and that's aimed at a product launch in the first quarter of 2016."

The company has developed a high performance, flexible baseband architecture called Hydra and previously tried to sell this as a chip. "The IP is embodied in the chip and we are working with semiconductor partners to develop that chip. We have no plan to become a fabless semiconductor supplier again. The semiconductor supplier in this value chain is not delivering as standard OEM chip, it's effectively an ASIC supplier to the customer, and the end customer has a relationship with a far eastern OEM for production. The whole deal is aimed at reducing the margin stack. It took some time to figure it out but we think we have a working model."

Several companies – notably Infineon – have already launched 60GHz products for backhaul but Barrett says this is positive for the company.

"As far as Blu Wireless is concerned all these companies are partners for as as we do baseband not RF, so it's great that Infineon are doing what they are doing," he said. "By understanding is they work with FPGA solutions for sophisticated baseband for the products rolling out. In those kinds of products it's quite normal for the product OEM to develop their own modem with FPGA or DSP chips and in that immediate market RF vendors are partnering with FPGA solutions such as Xilinx that provide an immediate solution. But these are too expensive and cost is king so it's a strategy that will have a certain lifetime but the second generation technology with much greater integration for phased array antenna systems rather than high gain dish antennas that are mechanically aligned for point to point links. So we have non-disclosure agreements in place with certain companies. The RF companies don't have baseband any more and are coming to us, more so than we originally thought."

The 60GHz technology is also applicable to the next generation of WiFi broadband Internet as well as replacing cables for high speed data and the Blu Wireless technology can also be used in these applications.

"We welcome any major company coming to market and standing behind 60GHz,"said Barrett. "We saw Qualcomm do the same thing with the acquisition of Wilocity back in June [last year] and we continue to be interested in WiGig and 11ad."

The main issue the company faces is the radio regulations for 60GHz outdoors in Europe that limit the develop of phased array systems, says Barrett. In the US the regulations allow a trade off in gain and power which can be used for a for phased array that gives benefits in being able to 'steer' a beam and use a software defined networks, as well as being physically smaller. "In Europe you can't do that because the rules separate power and gain, leading to a much larger mechanical antenna that you can't steer," said Barrett.

"It's my understanding that Ofcom [the regulator] is to harmonise regulation across Europe, but that said they can do something on a national level if it's in the UK national interest with a waiver but they need to be persuaded of the economic benefits of doing that. For our part we will be building a trial network in Bristol and on the back of that trial we expect to attract the interest of several operators and use the network as an exemplar."

The plan is to have a trial mesh network up in the next few months using 60GHz where each link is a few hundred metres in length. Blu Wireless is building the end equipment itself, providing the baseband chip, MAC, PCBs and working with Silicon Image on the radio side, and it has a partnership with Murata in Japan for the antennas.

www.bluwireless.com

Terabit network up for approval

Bristol Is Open, the high speed network across Bristol, goes to the council's Cabinet on 3 February to get the approval to start operations.

The initiative will create an experimental high-speed network where technology companies, research organisations and small and medium-sized enterprises will be able to develop and experiment with the next generation of network technology and create a real-world test-bed to help understand issues such as mobility, health and energy efficiency in the modern city. The network will also generate anonymised data that can be used for research and development in many aspects of city life, including energy, air quality and traffic flows. This is made possible by a unique City Operating System (CityOS), developed by Professor Dimitra Simeonidou and colleagues in the University of Bristol's High Performance Networks research group over the last five years.

"This pioneering project has massive potential and will go further to cement Bristol's growing international reputation as a collaborative laboratory for change," said George Ferguson, Mayor of Bristol. "During our year as European Green Capital and beyond it will help people develop tomorrow's technology and better understand how a modern city operates; linking things up in brand new ways and opening us up to all sort of possibilities.

Professor Nishan Canagarajah, Pro Vice-Chancellor for Research at the University of Bristol, added: "Bristol Is Open will enable the people of Bristol to interact, work and play with their city. The project is a unique opportunity for the University and city council to work together to ensure the city is at the forefront of technological innovation.

"The University has invested £12 million in its Advanced Computing facilities since 2006, making it one of the country's leading centres, and its supercomputer is a resource for the whole city. Some of the projects that will benefit from the joint venture are TOUCAN (Towards Ultimate Convergence of All Networks), SPHERE (a Sensor Platform for HEalthcare in a Residential Environment) and ICIF (International Centre for Infrastructure Futures).

"TOUCAN is addressing the global demand for broadband communications by revolutionising the way communication networks are built and used, and SPHERE is developing sensor systems to monitor health and wellbeing in the home. This is an exciting time for the city."

If approved, Bristol Is Open will allow for the trialling of new technologies in a range of industries including media broadcast, entertainment and culture. The project will also benefit the development of autonomous systems, robotics and advanced manufacturing in the city.

"Bristol has a reputation for being a city of innovation and a place where people can come to test their ideas, as recently recognised by our International Award for Urban Innovation from our sister city Guangzhou," said Stephen Hilton, Director of Bristol City Council's Bristol Futures team. "Bristol Is Open and the infrastructure it will deliver is yet another example of this great city putting a bold first step forward on the long road to greener, more efficient urban living. Growing city populations, climate change and scarcer resources are but a few of the growing problems cities face from Bristol to Bordeaux to Porto. Bristol Is Open will provide a test bed that enables researchers, companies and organisations from around the country to come together in the spirit of innovation, with the aim of exploring solutions on a city wide scale."

The proposed research infrastructure is an experimental broadband, wireless and high performance computing network that will stimulate and study how telecommunication, software, hardware, data and sensing technology come together in a medium sized European city. This is the Open Programmable City.

The infrastructure put in place will enable the collection of anonymised data from other connected devices on a grand scale within the high speed network area to provide Big Data by Bristol Is Open's Software Defined Network with the University's IoTBay platform on the high performance computer.

This data will then be analysed and programmed by applications developed during the coming year to reveal new insights into how the city operates in real time. Insights drawn from the collection and analysis of this Big Data will enable Bristol Is Open to form partnerships with a variety of organisations seeking to develop solutions to many of the challenges facing a city in the 21st century.

www.bristolisopen.com

Bath hosts nano-engineering hub

The University of Bath, along with Bristol, Sheffield and Strathclyde and industrial partners, have been given funding of £2.65m to develop the UK into a future hub for the manufacture of advanced semiconductor materials.

The Engineering Physical Sciences Research Council (EPSRC) grant will fund equipment and researchers to develop advanced manufacturing techniques for nano-engineered semiconductors, particularly the III-nitrides.

The III-nitrides include semiconductors such as Gallium Nitride (GaN) which underpin the emerging global solid state lighting and power electronics industries. Creating three-dimensional structures at the nanoscale provides a route to improving the quality of these materials and in turn the performance of these devices. Ultimately this will increase the energy efficiency in these and other emerging applications, such as water purification, where ultra-violet LEDs are used to prevent viruses reproducing.

The funding will also enable the design and scale-up of a new generation of sensors based on nanophotonics, exploiting the unique optical and piezoelectric properties of the III-nitride materials.

"This grant will enable us to develop the nanostructuring processes on a manufacturing scale along with reproducible device designs and measurement techniques to unlock the potential of these properties in a range of materials and innovative nano-devices," said Dr Philip Shields, project lead from the Department of Electronic & Electrical Engineering.

Bristol & Bath SIG programme starts

The Special Interest Groups (SIGs) under High Tech Bristol and Bath are taking off with the appointment of a network manager to drive meetings for education and skills, high performance computing, embedded systems and health technology. An immersion event brought together industry and educators and will be followed by a series of lectures from Prof David May.

These are a great way to allow people working in similar fields to connect up, and Dr John Bradford is working at HBB to set up the activities for organisations in the Bristol and Bath area starting with embedded software verification in February and HPC in April. The SIGs are open to individual and corporate members anywhere in the world, bringing together expertise in a wide range of technologies. There are already ten members, with interests in wireless, multicore, embedded software and education and skills, with more joining every week. The Terabit network (page 7) will be a key part of the activities of several of the SIGs.

The SIGs are determined by the members, with two to three SIG champions running the groups with support from central administration to determine the frequency, location and content of meetings. SIG champions are elected by the membership of the groups, and are also represented on the board of HB2 as a Community Interest Company (CIC) alongside the High Tech Sector group of the regional Local Economic Partnership. Unlike other SIGs, HBB will use the existing strong networking organisations in the region to host events and keep the administration overheads as low as possible while delivering key pieces of work. A number of SIGs have been proposed, with SIG champions needed to lead them and determine their direction.

HBB is a membership organisation, where companies or individuals join and any staff or faculty member can attend any SIG meetings, vote for SIG champions and propose new SIGs. There are plans for a wider range of additional benefits that will be developed to support members.

For info and to sign up, contact: Dr John Bradford, john@hbb.org.uk

www.hbb.org.uk

High Tech centre for robotics and innovation

A new initiative to encourage and support the take up of robotics and high tech systems within industry across Europe has been set up at the Bristol Robotics Laboratory (BRL).

The Robotics Innovation Facility (RIF) based at BRL is part of the ECHORD++ project, a €20m initiative funded by the 7th Framework Programme for Research and Technological Development.

The Bristol RIF aims to stimulate the interaction between robot manufacturers, researchers, and end users, by providing free access to robotics equipment and experts. Technical support is provided by a dedicated RIF team, with additional assistance from engineers and scientists within Bristol Robotics Laboratory. The projects can be about control systems and electronics as much as robotics and software and the project will run until 2018.

The RIF acts as a gateway for business, especially SME's, to help them work with new robotic technologies; develop markets for new robotic products, services or processes; demonstrate proof of concept in novel robot application areas; and develop new value chains in existing and emerging sectors such as electronics and displays. Projects can have up to 6 weeks of s upport with equipment and engineers. This can be extended if the project needs it. Bristol display startup Folium Optics has already made use of the programme.

"SMEs, other businesses and manufacturers can sometimes find it difficult to access the latest technology, and understand the potential of robotics and how future deployment could help their business. For example, companies frequently have a product or process idea or improvement but can't take it to the next stage within their current capabilities," said Farid Dailami, who heads the Bristol RIF. "A company may hear that an expensive robot could help their production capacity, but they are unable to access the equipment or software that would allow them to verify this before investing significant time and money in a new system. Through the RIF we would be able to carry out the necessary experiments and modelling to help them understand possibilities, and resource permitting, support them in getting extra funding to continue development. We can also introduce companies to national and Europe-wide networks beneficial to the development of their innovation and ideas.

"In the first instance companies get in touch with us and through an application process we learn more about what they are trying to do. If the company is eligible, and once we are clear what the problem is and how we can help, we set up a meeting and take the process forward. We are also offering a series of workshops which will help participants to develop their understanding of this field and the potential of robotics to enhance their business."

Professor Chris Melhuish, Director of the Bristol Robotics Laboratory says, "BRL is leading the way in Europe in this project, providing a service that bridges the gap between industry and the latest research in robotics. At BRL we are committed to research that that has a positive impact on society, industry and the economy. The RIF is an opportunity for us to share the latest innovations in robotics and support existing and new businesses in an ever increasing competitive economy."

There are three RIFs in Europe. The Bristol RIF is the lead institution – the other two RIFs are based at SSSA, Pisa in Italy, and CEA, Paris in France, launching in January. Bristol acts as the clearing house for the projects to be allocated to the most suitable centre, and there is a small fund to support travel and subsistence for the project duration.

www.echord.eu

Monetising R&D: more SMEs cash in

The popularity of the government's R&D tax credit scheme was revealed in recent figures from the Treasury showing a 40% increase in take up of the programme by small and medium-sized enterprises (SMEs) across the UK in 2012-13. SME companies in the South West accounted for 1,040 claims in the year worth around £45m. The scheme was enhanced at the end of last year to boost support for R&D, including an advanced assurance scheme will be introduced for small businesses making their first claim for R&D tax credits.

So how does it work?
The first thing a company needs to do in considering a claim is to identify a project or projects that seek to achieve an advance in overall knowledge and capability in a field of science or technology. This could be a new machine part or something more intangible such as information. The line between where R&D ends and product development begins has to be clear as the latter will generally not qualify.
Staff costs incurred in developing and testing a new algorithm for a piece of software, for example, would qualify for R&D. The further costs of integrating the algorithm into a software product are less likely to qualify, unless further testing to resolve uncertainties is required.
It can be surprising what expenditure can qualify for R&D. Costs that might otherwise have simply been written off in the accounts could actually be amplified for tax relief purposes. However, certain types of expenditure, such as rent and rates, are excluded.

Growth of the scheme
More than 28,500 companies have claimed R&D tax credits in the UK since the scheme was introduced in 2000. Industry sectors benefiting from the relief include information, communication, professional, scientific and technical, as well as the wholesale and retail trades. Even companies in such areas as the arts and education have qualified.
"In recent years the scheme has become even more attractive in terms of the relief offered and the scope of activities that qualify," said Nigel Warren, Tax Partner for Manufacturing, Technology and Innovation at business advisers Bishop Fleming. His firm submitted successful R&D claims in excess of £53m last year. "For SMEs the R&D relief actually inflates the 100% write off for revenue expenditure to 225% (*230% from 1 April 2015*)," he said. "If this creates a tax loss in the company and cannot be relieved until a future period then it can be converted into a repayable tax credit."

Example
If an SME incurs qualifying R&D expenditure for the year to 31 March 2015 of £120,000, then if the company is profitable it will be able to claim a deduction for this of £270,000 to reduce its corporation tax liability by £54,000 (assuming a 20% rate), giving the company effective relief on the actual expenditure of 45%.
If, on the other hand, the company makes a loss of £270,000 (all because of the R&D expenditure) which would otherwise be carried forward for relief against future profits then it can instead be converted into a repayable tax credit. At a rate of conversion of 14.5% this will generate a repayment to the company of £39,150 (£270,000 x 14.5%), which equates to approximately 33% of the original expenditure.

Some key conditions
To obtain the relief, the first essential matter to determine is whether HMRC will accept the activities are R&D. The second is making sure the relevant tax rules are met, including that the expenditure must be revenue rather than capital and not covered in some other way, such as a government grant.
"R&D is a valuable tax relief. Every £1 spent by an SME on qualifying R&D expenditure generates an extra £1.25 deduction, giving effective tax relief of 45%," said Warren.

Patent Box
A key issue is the interaction of R&D with Patent Box (see page XX). Whilst Patent Box provides relief for companies that have already developed their products, R&D tax credits provide relief for companies to develop their products in the first place. "Businesses that use Patent Box are also likely to be involved in research and development qualifying for R&D tax credits," said Warren. "The two regimes complement each other so companies can take advantage of both." However, Patent Box will close to new entrants in June 2016, though any existing participants will continue to enjoy the benefits until June 2021.

Welcome to the future

2015 is set to be an exciting year for technology in the West of England region. With our region's stars showing their expertise across a huge range of applications at the Consumer Electronics Show, we have home grown startups such as Ultrahaptics and Fusion Processing gaining global presence and working alongside more established ventures such as Blu Wireless Technology (BWT) and XMOS (page 2).

BWT (page 7) has seen the opportunity of the coming terabit network to be rolled out by Bristol is Open (page 8), and this opens up opportunities for collaboration in many different areas, from telecoms and software to the Internet of Things, sensors networks and health technologies. Projects such as SPHERE (page 8) will start generating interesting results for health management, while driverless cars will be on our roads, testing out technology as part of the VENTURER project (page 4)

Behind all of this is a growing set of special interst groups, tackling regional issues such as education and skills and allowing companies and researchers to come together in areas such as embedded software and high performance computing. With the infrastructure established, High Tech Bristol and Bath (HBB, page 9) is up and running to support groups coming together in several different areas, led by the industry needs. One of these will be the challenge of making the best use of the tremendous bandwidth available with a terabit network that spans Bristol and Bath that hosts world leading technologies such as BWT and the supercomputers at the University of Bristol.

All of this makes 2015 a very exciting time to be part of the Bristol & Bath cluster. The opportunities are endless, and with the expansion of the EngineShed as one of the termination points of the network, and the Innovation Centre in bath as another, we really do have a privileged insight into the shape of the future.

Nick Flaherty

Quantum Centre plans future development

Bristol and Bath are two of the leading areas for quantum technologies in the world, but recent bids for funding to host a specialist research hub have not been successful.

Four out of an original six proposed hubs have been announced, with Bristol part of the Glasgow-led Quantum Imaging Centre, and the Quantum Communications at York, while Bath is collaborating with the Oxford–ed Computing and Simulation hub and hosting the nano-engineering centre (page 9) that will play a key role in quantum photonics.

All of this is bringing millions of pounds to support leading edge research in the region. But there is more to do, as the Centre for Quantum Photonics at Bristol is already demonstrating quantum computing technology and in a position to commercialise it. So there are bids in development for its own specialist centre along similar lines to the national Composites Centre up the road at the Bristol and Bath Science Park.

This technology has the potential to be the computing platform of the future, and the region has key expertise and a lead in the technology, making an investment a significant opportunity, both for building systems and spinning off startups at the leading edge of computing, communications and security.

Watch this space.

About the West of England Local Economic Partnership

The West of England Local Enterprise Partnership supports business growth and is working to attract new jobs to Bristol, Bath and Weston-super-Mare. The structure supports the LEP Board in making it happen, backed by multiple Sector Groups including the High Tech Sector which meets once a month. More information on the vertical and cross cutting sector groups is here. For more information or to get involved join the LinkedIn group and sign up for the High Tech Sector Newsletter at SW Innovation News for news of events and Special Interest Groups

High Tech News is published by SW Innovation News (www.swinnovation.co.uk) for the High Tech Sector group of the West of England Local Economic Partnership. For custom newsletters for your company or events, please contact Nick Flaherty nick@swinnovation.co.uk