

AUTUMN | WINTER 2020

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What does it feel like when your hard work starts paying off?





The Rt. Hon. Caroline Nokes MP, Member of Parliament for Romsey and Southampton North, reflects on 2020



Southampton Science Park's Catalyst programme welcomes its tenth cohort





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but not as you know it

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Something to shout about?

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SO...

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Taking stock 8 What does it feel like when your hard work starts paying off?

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The Rt. Hon. Caroline Nokes MP, Member of Parliament for Romsey and Southampton North, reflects on 2020

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Southampton Science Park's Catalyst programme welcomes its tenth cohort



Welcome to **SO**

Often, it takes a crisis to catalyse innovation. Time and again, it's proven that difficult situations, like those that many businesses have faced so far this year, have laid the foundations for original thinking.

These contemplations may be about the ongoing relevance of their existing technology, about new potential market applications, about go-to-market strategies and planning. It matters not – the main thing is a willingness to adapt.

We have witnessed many examples of this adaptivity in action amongst our resident community. The Science Park team, too, has remained resolute in its drive to enable these brilliant businesses to continue to grow, come what may. In the midst of a global pandemic, I can confidently report that there's no shortage of innovative ideas and driven entrepreneurial spirit here on the South Coast!

We have recently welcomed eight early-stage businesses to our Catalyst business accelerator programme. I was delighted with both the quantity and quality of applications this year, testimony to the obvious reputation that the Catalyst Centre has. We feature an overview of these businesses and their aspirations in this issue.

We have also embarked on a series of new projects and investments which reflect the needs of businesses now, as well as anticipating those of the future. Work has begun on the creation of a new facility, for example. The Future Towns Innovation Hub will be a collaborative environment for breakthrough engineering research and technologies, enabling leading academics and businesses to work towards making the region's towns cleaner, healthier, happier places to live and work.

We have also created new collaborative working spaces and worked fast to support companies looking to upscale or downsize their operations based on their specific market conditions. And, as employees began to return to their offices over the summer, we saw an opportunity to move away from 'business as normal' for their daily commute. Working to help people rethink solo car journeys, we have invested in additional electric vehicle charge points, a car club scheme for ad hoc journeys and a new local bus service which links to air and train connections at Southampton Parkway.

Inevitably, some of our plans have had to change. Some prestigious events had to be postponed and cancelled, so we adapted our education and business support accordingly with the launch of a series of Lunch & Learn webinars. Short, focused, varied and highly practical, these sessions were well received and we will look to continue them over the winter.

There's no doubt that we will continue to face significant challenges in the months, possibly years, to come but there should also be reassurance that those businesses with strong foundations will see strong recoveries. And we will be with them every step of the way.

Dr. Robin Chave

Chief Executive Officer The University of Southampton Science Park

what?

- **SO** sees the future differently
- SO connects
- **SO** asks questions
- **SO** engages, informs, inspires
- **SO** celebrates success
- **SO** shows how Southampton Science Park shapes society
- **SO** makes science and technology social
- **SO** shines on South Coast excellence

SO where could it take you?

A well-earned lunch break with colleagues, somewhere to plug in and zone out on your own, or simply a friendly face to help you grab and go when you're in a hurry: the Science Park's new Fusion café is now open for all residents and visitors to enjoy, however you need fuelling.

Kelcome To

IN FOCUS



SCENIC

MN | WINTER 2020

DR TYLER WARD IS A SENIOR ENGINEER AT SCIENCE PARK-BASED COMPANY AUDIOSCENIC. AGED JUST 30, HE HAS **BEEN RECOGNISED AS ONE OF THE BRIGHTEST AND MOST TALENTED** YOUNG ELECTRONICS **ENGINEERS IN THE** UK TODAY.

Each year Electronics Weekly sets out to celebrate the achievements of the most talented young people in the electronics world. Through its BrightSparks initiative, it hopes to inspire and encourage new entrants into the engineering sector, particularly important in the context of the well-publicised skills gap in STEM.

Tyler Ward of Audioscenic achieved a place on this 2020 elite list. We sat down with him to ask what sparked his interest in engineering.

TYLER, WHO OR WHAT INSPIRED YOU TO **CHOOSE ELECTRICAL ENGINEERING AS A**

CAREER? I have long had an interest in building things and understanding the way things work. I guess it all started with Lego! It provided me with entertainment and got me thinking about how things are put together while I was assembling various designs and contraptions.

This interest continued throughout my childhood, when I would often design and build things or modify things to be better, but my school work experience at Hamlin Electronics confirmed it as a potential career path. The company used to design and produce custom sensing solutions for automotive applications and my two weeks there enabled me to experience engineering as a profession first hand.

I came to Southampton for my undergraduate degree in electronics, having been impressed by the course content and facilities available at the University. I continued there after my degree to complete an electronics PhD on the Internet of Things and then worked on various commercial and research projects at the University for a few years before joining Audioscenic in March 2019.

IF YOU BELIEVE IN A PRODUCT THEN IT ISN'T JUSTA JOB, BUTALSO AN ENJOYABLE JOURNEY

WHY DID YOU DECIDE TO LEAVE ACADEMIA

BEHIND? The transition out of academia and into the commercial space started when I was still doing my PhD. I started helping with some consultancy work, which led to the opportunity to work on the commercial SharkStream project. This gave me the experience of taking a project from concept to viable product and I found this more rewarding than taking ideas just to the proof of concept phase, as I had during my PhD. Being somewhat dyslexic, I had always found writing research publications difficult so being able to leave them behind was a nice benefit as well. After SharkStream I moved onto the Smartmove project, which, while enjoyable, confirmed that my place lay outside of academia.

WAS THE TRANSITION INTO A COMMERCIAL **ENVIRONMENT CHALLENGING IN ANY WAY? DID** YOU NEED TO DEVELOP ANY NEW SKILLS?

Many of the skills useful in undertaking a PhD are the same as are needed for working in start-ups, so the transition was fairly smooth, but I have certainly picked up new skills.

The main thing is a new mindset. In academia, things typically only need to work in a controlled setting and you're usually around to make adjustments if it doesn't work correctly the first time. When designing a product in a business environment however, it needs to work reliably all the time, without needing to be reset or adjusted to function well. This requires a different approach to the product development lifecycle.

WHAT ATTRACTED YOU TO AUDIOSCENIC?

I originally met the founders of what was to become Audioscenic when I was working on the SharkStream project at the University. We were both exhibiting at the Consumer Electronics Show. At this time, it was a proof of concept, but it clearly had potential so I stayed in touch as their technology advanced. When I heard that they were progressing through their seed funding round and were looking for people to join the team I jumped at the chance to work on an interesting and innovative technology and with people I knew it would be great to work with.

My role is varied and has evolved. Initially, I had expected to be involved in more R&D and concept development activities, as is common on research spinouts, but we made good commercial contacts early on so we focused on developing those rather than prototyping future product concepts.

ANY THOUGHTS ON WHY YOU CHOSE TO WORK FOR AN SME OVER A CORPORATE ENTERPRISE?

One of the great things about working in a start-up is that, due to being a small team with a rapidly evolving product, there is huge variety in the work across a wide range of engineering areas so it's never repetitive and there are always new and interesting challenges to solve.

LOOKING FORWARD, WHERE DO YOU SEE YOUR CAREER TEN YEARS FROM NOW? DO YOU SEE YOURSELF AS ENTREPRENEURIAL, PERHAPS STARTING YOUR OWN BUSINESS AT SOME

POINT? I have discovered that, if you believe in a product, then it isn't just a job, but also an enjoyable journey. So, I would expect to still be working in an environment where I believe in the product being created.

IT'S EASIER TO BUILD YOUR IDEAS THAN EVER BEFORE

Currently, I'm not sure I would want to take on a purely managerial role as I would miss getting involved with the technology itself. However, as I have quite a broad range of engineering skills, I can see myself potentially leading a multidisciplinary team where I can bring together different areas and fill in the blanks of more specialised colleagues.

Through my time involved with projects supported by the Future Worlds incubator, I picked up many of the skills needed to run a business so I would definitely also consider starting my own business in the future if or when I come up with an idea that I am passionate enough about and which could form the basis of a viable business model.

TALENT

AND, LOOKING BACK: IF YOU COULD GO BACK TEN YEARS AND GIVE YOURSELF SOME ADVICE. WHAT WOULD IT BE? Something I never

realised at the time, but which is obvious now, is that University doesn't just teach you the professional skills you will need, but the wider University experience also gives you the chance to grow as a person. It's easy to forget how much limproved as a person during my studies, so my advice to myself would be: don't worry about the life and people skills you are missing when you start University because you are entering the best time to learn them.

WHAT ADVICE WOULD YOU GIVE OTHER YOUNG **PEOPLE CONSIDERING A CAREER IN**

ENGINEERING? Building your own projects is a great way to improve your skills or gain new ones. Many of the skills or technologies I now use regularly are those I first experimented with on a personal project before finding professional uses for them.

The rise of the maker culture over the last few years means there are a lot more resources available to learn from than there were when I was in school and this makes it easier to build vour ideas than ever before.

From a work/life balance perspective, learning when to say 'no' is an important skill, too. I have found that if you enjoy what you do, it is easy to take on too many things and wear yourself out, but this results in everything suffering.

AUDIOSCENIC USES SMALL ARRAYS OF SPEAKERS AND ADVANCED HEAD TRACKING TECHNOLOGIES TO DELIVER **TRULY IMMERSIVE 3D SOUND WITHOUT** THE NEED FOR HEADPHONES OR COMPLEX ARRAYS OF SPEAKERS LOCATED AROUND THE ROOM. THIS PROVIDES AN AUTHENTIC AND NATURAL AUDIO EXPERIENCE FOR CONSUMERS OF IMMERSIVE GAMING, VIRTUAL REALITY AND MOVIE AUDIO.

AUDIOSCENIC.COM

GROWTH



is the first major milestone - almost an end goal but actually, this is when the real work begins. What does it feel like when your hard work starts payingoff and the money starts rolling in, and what are the pitfalls to be aware of? Entrepreneurs who have been on this journey share their experience and advice.

Establishing a business in any sector is a journey into the unknown. From the seed of an idea to working through the night at the kitchen table (while often juggling a full-time day job) to taking on office space and staff, it's not for the fainthearted.

In the innovation sphere, this challenge is often amplified by the time needed to execute in-depth research and proof of concept before approaching the market and, of course, convincing investors to risk their own hard-earned cash on little more than an idea.

David Bream has first-hand experience of this challenge several times over, both as founder of his own enterprises and as Director of SETsquared Southampton where he coaches other early-stage businesses.

He advises: "Knowing when you're ready to pitch for investment is rarely anything to do with hitting a particular development milestone - people with just an idea can be successful in raising money - it's more to do with having a clear plan and being able to communicate this in a compelling way to the right investors. You must be confident about who your customer is and why they care, how you're better than the competition, and your capability to build a team with the necessary skills and experience to deliver your business plan."

"An investment in knowledge pays the best interest Benjamin Franklin, political theorist, scientist, and inventor If you've got all this in hand, how do you decide who to target?

David continues: "There are many dimensions to this: sector experience (noting that multiple investments in the same area can be a good or bad thing), geography (the investor will want to monitor you so make it easy for them to do so), matching the stage of company development to funds with the same aim (seed, series A, growth) and timescales for the release of funds.

"The most important thing, however, is to ensure that you can work well with the investor in the long term. It's tempting, but don't take money from anyone who'll give it to you! You'll be working together for many years, often through stressful times, so a good relationship is essential."

"Seek advice on risk from the wealthy who still take risks, not friends who dare nothing more than a football bet'

Jean Paul Getty, Anglo-American industrialist



It has won four Innovate UK grants and completed four funding rounds. Adam commented on the experience: "Our first funding was an Innovate UK proof of concept grant, which enabled us to get off the ground. The grants have been very important as we have had to make a big investment in R&D over five years. I am not sure we could have funded it all from equity. Our lead customer has also provided a significant amount of funding. People sometimes forget that customers are a source of funding, particularly if you are developing a technology that is important to them."



- Adam Kingdon founded Utonomy in 2015 to transform gas network pressure management.

GROWTH

He continues: "It is important to have a really clear business plan and use for the funds that you're raising, so anticipate as many eventualities as you can. Aim to raise more than you think you will need so you have time to finalise your product, achieve sales and get to a breakeven point. Finally, be careful about who you take investment from. Take references. Ask yourself how they will behave if things get tough: will they be supportive or not?"

Since its inception just three years ago, medtech company Renovos has successfully secured multiple investments – grants from Innovate UK under the Innovation in Health and Life Sciences stream, SMART awards from Solent Local Enterprise Partnerships, and seed equity investment from Business Angels, a family office and a research charity working in the same sphere.

Reflecting on these experiences, its founder and CEO, Agnieszka Janeczek, said: "The right investors, aligned with your business, open their networks and can provide very useful contacts that help to advance the company, start new collaborations and raise further investment. That was the case with Renovos and our sector-specific investor, who helped open the right doors within the industry."

She continued: "If you can, complement investment with any non-dilutive funding available from government and local grants, professional societies as well as business accelerators. We have been very fortunate to secure non-dilutive government funding for our projects twice, and we've found that extending the cashflow this way helps you preserve your stake in the business and it is also well received by any investors."

"Opportunity is missed by most people because it is dressed in overalls and looks like work"

Thomas Edison, American inventor and businessman



While it can take some time to secure investment in the first place, it usually enables companies to achieve things more quickly than if they were relying on retained earnings and organic growth. This might mean getting products to market earlier and building sales and distribution more rapidly.

Acceleration was the key driver for Fresh Relevance which secured £2.15m from Foresight VCT plc. Founders Mike and Pete Austen sought equity investment for growth because they knew their company could benefit from growing fast in a very rapidly expanding market.

"It was a big change," remembers Mike. "We went from doing everything on a shoestring and thinking constantly about immediate cashflow to being able to make proper investment decisions based on the medium-term best interests of the business. It has enabled us to achieve a huge amount. It's given us a lot of flexibility to invest in new directions and product development that we wouldn't have been able to do without investment."

He agrees with David, Adam and Agnieszka on the importance of strong relationships. "From the outset, be aware that you're 'hiring your own boss'. Do your due diligence on the investors you're approaching. Ask people they've invested in at least a year ago. You'll be working very closely with them and you need to make sure your interests are really well aligned for the long term. Our investors are super supportive, but I know others have not been so lucky," he commented.



"It takes 20 years to build a reputation and 5 minutes to ruin it. If you think about that, you'll do things differently"

Warren Buffett, American business magnate

Speed to market is often a critical success factor in science and technology businesses, but to what extent could this be throttled back by diverting management time and attention to funding efforts?

Agnieszka said: "For each of our funding rounds, the process has taken about six months. The main thing to realise is once you go down the equity funding route for your company, fundraising never ends. You secure your first round of financing, and almost immediately you start planning for another. So it's important to secure funds from well-connected investors as it makes consecutive rounds easier."

Adam concurs. "My advice is to start early. Raising equity is time consuming and always takes longer than you think: we plan on about six months from starting the round to closing it," he comments. "But it's also very exciting. Securing funding enables us to move on to the next stage, expand the team and accelerate product development."

"Only those who are asleep make no mistakes" Inguar Kamprad, Swedish business magnate, founder of Ikea

Implementing the plan that you promised the investor that you would implement sounds easy enough. In reality, things rarely go to plan. It's sheer hard work. Once you have raised outside equity, communication with your investors is absolutely key and being able to negotiate changing circumstances with them is a skill that you'll need to be quick to learn.

Mike advises: "Make sure you're comfortable with the additional scrutiny and rigour about planning and budgeting. This additional rigour is usually a good thing for the business, but often entrepreneurs are used to being able to make rapid decisions on their own, so you'll need to change your mindset a little."

Agnieszka shares this experience. She says: "Being able to raise funding with people who share our vision feels very rewarding, and when the money starts rolling in, it pushes us to progress the technology as fast as we can. But investors are there to challenge your thinking and also keep track of hitting consecutive milestones, so it's important to have a good relationship, communicate frequently and provide updates. This helps when things don't go to plan – as inevitably is often the case with developing highly innovative technologies – which is not unexpected and there is common understanding around this."

David adds: "For investors, this is their day job and they're likely to have completed many investments. However, for most entrepreneurs, it's likely to be a relatively or completely new experience. Many of the world's biggest and best tech companies start in California precisely because they have investors with the weight of funds and experience to help build high growth companies. So, the cards are stacked in the investors' favour: they have the money and they have the experience. Level the odds a bit by getting help and advice."

" I hen everything seems to be going against you, remember that airplanes take off against the wind, not with it' Henry Ford, American industrialist





OPINION



A PARLIAMENTARY & PERSONAL VIEW

The Rt. Hon. Caroline Nokes MP, Member of Parliament for Romsey and Southampton North, reflects on 2020.

"I don't think any of us would describe the last six months as easy, and the challenges have come at both Government and business thick and fast.

My new role as Chair of the Women and Equalities Select Committee has meant that not only have I looked at the pandemic from the perspective of the constituency MP here in Romsey and Southampton North, but also considered the impact on those with protected characteristics. We suspected when the lockdown started that it would be tough for those in insecure employment, for those working part time, especially for the young working in the gig economy. I don't think any of us predicted it would be quite as bad for women as it has been, or the dreadful way in which the virus has most impacted those from Black, Asian and Minority Ethnic (BAME) backgrounds.

Very early on, my Committee launched an inquiry into how Covid impacted women, BAME people and the disabled, and over the course of the last few months we have taken evidence from a range of experts, stakeholders and Ministers. We know that women have carried the largest share of childcare and home-educating, that they have been more likely to be furloughed than their male colleagues and that, as redundancies have happened, there has been a greater impact on men than women.

But there have also been unexpected freedoms. We have all learnt that we can work from home successfully. Those meetings for which we would have previously travelled all around the country or the globe, they could happen just as successfully via Zoom. We found we could recover time previously spent commuting and use it more productively. But there were downsides to the newfound freedoms. The collaboration that used to happen in the coffee shop was lost, many of us felt genuinely isolated and missed the daily interaction with colleagues, and parents found that juggling childcare and work was not always easy.

I know I saved a fortune by not purchasing my daily latte or two, three or four, but I missed the interaction I have routinely with constituents at Josie's in Romsey. I did not have to juggle childcare, my daughter just got on with her dissertation, but the dog is now definitely suffering from separation anxiety, having benefited from intensive training and company all day every day.

Caroline Nokes photo - Richard Townshend / CC BY (https://creativecommons.org/licenses/by/3.0)

THERE WERE DOWNSIDES TO THE NEWFOUND FREEDOMS. THE COLLABORATION THAT USED TO HAPPEN IN THE COFFEE SHOP WAS LOST, MANY OF US FELT GENUINELY ISOLATED AND MISSED THE DAILY INTERACTION WITH COLLEAGUES, AND PARENTS FOUND THAT JUGGLING CHILDCARE AND WORK WAS NOT ALWAYS EASY.

From the perspective of business in this constituency, many have benefited from the small business grants, rate relief and furlough. The Bounce Back Loans worked well in the main, although there were cases that I helped with when banks were not processing as quickly as they might. But those paid through dividends have missed out badly, being ineligible for either furlough or the self-employed Income Support Scheme. As a constituency MP it has been my role to advocate for the extension of more help to the "excluded" and I have done that vigorously, but to a Chancellor who has already stretched the public purse a long way.

We must not forget that ultimately the Government has no money, it is all taxpayers' money and there will be an eye-watering bill at the end of the pandemic. But undoubtedly the right thing has been done to try to save businesses and jobs. I never forget that the Chancellor is one of us and used to travel daily from his home in Bassett to attend school in Romsey, passing the entrance to the Science Park. I really must make it a priority to invite him back to speak to those business leaders here, who he will have to turn to in order to kickstart the economic recovery. Much has been said about a focus on tech jobs, on green technology in particular, which we have in abundance here in Chilworth, so high time he popped in to say hello."

OPINION



SOUTHAMPTON SCIENCE PARK'S CATALYST **PROGRAMME WELCOMES ITS TENTH COHORT**

This autumn, eight early stage businesses took a major step forward. Following a competitive pitch process, the founders of these new companies entered Catalyst, the Science Park's business accelerator programme.

Here, we reveal their ideas and aspirations, and encourage anyone who may be able to assist with their growth journey to make contact.

GENERATES



3D GENERATES IS POWERING THE FUTURE OF 3D DIGITAL DESIGN.

- Founders: Mitch Wisniewski, Shane Baxter, Cornel Kadillari
- What's the big idea? 3DGenerates is developing an artificial intelligence-based Pandora's Box for creatives dealing in highly technical work. Acting as a companion designer, this innovative software works alongside artists, reviewing past work to generate new designs.
- Who will benefit? The initial customer focus is the furniture design industry, but all creative industries developing 3D concepts will benefit: architects, game developers, product designers and so on. Ultimately, there's space in every design team for an AI assistant generating new designs at a cost no greater than keeping the engine running.
- Why is this important? There is a never-ending demand for new designs, posing a significant

ABSOLAR IS ACCELERATING THE UPTAKE OF SOLAR ENERGY WITH AI AND GIS.

- Founder: Phil Wu
- What's the big idea? Absolar is deploying advanced artificial intelligence (AI) and geographic information system mapping (GIS) technologies to help organisations with extensive building footprints to accurately evaluate the solar feasibility of their rooftops and to access finance.
- Who will benefit? Local authorities, public sector organisations, private sector companies with large property portfolios, and solar installers.
- Why is this important? Organisations with extensive building footprints are currently unable to evaluate their portfolio for solar feasibility and other carbon reduction interventions without

MAVERICK AVIATION IS ENABLING INDIVIDUALS TO ACCESS INACCESSIBLE TERRAINS.

- Founder: Antony Quinn
- What's the big idea? Maverick Aviation is the creator of a portable, lightweight jetpack, designed to get specialists to where they are needed rapidly by giving them the ability to fly with complete safety, under semi-autonomous hands-free control. It will enable individuals to reach otherwise inaccessible physical objectives over land and water.
- Who will benefit? Disaster relief rescue teams, engineers in the offshore wind turbine maintenance industry, defence and security teams, and the growing personal experience market.
- Why is this important? Many commercial and government organisations face the challenge

START-UP / SCALE-UP

(1)

challenge for creative people in design industries to meet this need. Exploiting past design portfolios offers untapped potential to solve this issue as this solution uses passive design as a basis to independently generate new products.

- Did you know? In March 2020, IKEA announced its intention to double its design team over the next two years.
- Mitch says: "Key challenges for us will be convincing investors to take a leap of faith on a novel use of technology, as our next stage will be to fund full-time software development, as well as the ability to make meaningful international connections with potential customers at this time. Our concept is complex and at the time of pitching for Catalyst I was still very new to verbalising it concisely. I am glad that the panel could see through all the redundant tech talk about how it works to see the bigger picture of what it can do."

significant time and expense by teams of onsite surveyors. Absolar's solution facilitates ondemand and at-scale feasibility studies, and helps scenario planning plan for various other carbon interventions that are available to each individual building. This will enable them to plan with confidence to achieve cost-effective energy generation, reduce carbon emissions and design a pathway to a Net Zero status.

- **Did you know?** Covering 60% of all south-facing commercial roofs with solar-PV is estimated to meet the energy needed for UK businesses, with average savings in energy bills of £30,000 each year.
- Phil says: "Customer interest is strong, but we now need to refine our business plan and establish a strong go-to-market strategy to swiftly convert interest into sales with focus and appropriate marketing."

of getting trained experts to access remote communities, infrastructure or physical tasks over land and sea quickly. Lives and money are lost by relying on conventional, costly and time-consuming methods - something Maverick Aviation has the answer to.

- Did you know? There's been a 240% increase in life-threatening earthquakes, tsunamis, floods, hurricanes and forest fires since 1980.
- Antony says: "Bringing a disruptive solution to market brings a unique challenge when the concept has existed for so long in science fiction; there is a skepticism hurdle that has to be overcome to allow meaningful conversations with end users. However, the greatest challenge is balancing the time spent between developing the business and developing the Jetpack. Both are equally important, but one is more fun!"

START-UP / SCALE-UP





• What's the big idea? OHS is working with mental health services to help people who are in greatest need of care and support get treatment when they need it most. Its digital solution, MaST, uses predictive analytics to identify those people who are most likely to require crisis services such as A&E, Community Crisis Services or inpatient care. OHS's solution gives NHS Trusts the insights needed to provide a joined-up approach to planning and delivering effective care for vulnerable people who may be at greatest risk.

OTSUKA HEALTH SOLUTIONS IS

- Who will benefit? NHS Mental Health Trusts.
- Why is this important? Community mental health teams are experiencing rising caseloads

(I)

and increasing numbers of service users with complex mental health problems. At the same time, the number of mental health nurses is declining. NHS information systems are often unable to bring together information from multiple agencies and provide a structured, holistic view of people's needs.

- Did you know? Mental illness is more common, long-lasting and impactful than other health conditions: it is the second largest source of burden of disease in England.
- Caroline says: "We are at the stage of early commercialisation, having launched MaST successfully in three NHS Mental Health Trusts. But we're a small team so securing new NHS customers, and delivering the very best value for them profitably, is challenging. I am delighted to have been successful with the Catalyst programme, by the end of which I hope to have a robust 5 year business plan in place."

Quantum SOLUTIONS

QUANTUM SOLUTIONS IS USING QUANTUM DOTS TO ADVANCE OPTOELECTRONICS.

- Founder: Osman Bakr
- What's the big idea? Quantum Solutions is developing and manufacturing unique Quantum Dots, new nanomaterials used in various optoelectronic applications, to enhance brightness, colour gamut and light sensitivity in the dark
- Who will benefit? Global high-tech companies producing LCD, OLED and ULED displays and those developing technologies in facial recognition, autonomous driving, machine vision, virtual reality, augmented reality and night vision. Universities focused on science and technology research will also benefit.
- Why is this important? Quantum dots are relatively new nanomaterials, increasingly used across the optoelectronic industry,

predominantly in displays and near infrared image sensors, but also in x-ray scintillators, QD LEDs and solar cells. In TV, laptop and tablet displays they benefit the user experience by presenting more vibrant colours with better contrast, while reducing energy consumption by up to 25%. In NIR image sensors (used in biometrics, autonomous cars, machine vision, AR and VR, night vision and surveillance devices), they offer higher sensitivity and wider enhanced compatibility.

- Did you know? Quantum dots were first used by Sony in 2013 for an LCD display. The global market has since grown to US\$3.5bn and is expected to reach US\$10.6bn by 2025.
- **Osman says:** "Quantum Solutions was originally founded as a spin-off from King Abdullah University of Science and Technology in Saudi Arabia. We are extremely happy to be chosen for the Catalyst programme, which will give us the expertise and connections that will help us grow our business and undertake Round-A investment."



- Founder: Ali Mosayyebi
- What's the big idea? Sooba Medical is developing urological devices, primarily stents and catheters, to improve patients' quality of life while at the same time offering significant savings to healthcare services, increasing their capacity and reducing hospital acquired infections.
- Who will benefit? NHS, hospitals and clinicians.
- Why is this important? Urological devices, such as stents and catheters, are flexible tubes used as a temporary solution by clinicians to assist with the drainage of urine in urinary tract obstructions caused by stones, tumours or strictures.

Zelemia

ZELEMIQ IS SUPPORTING THE DEVELOPMENT OF NEW MEDICAL TECHNOLOGY AND DEVICES.

- Founder: Rod Lane
- What's the big idea? Zelemiq is working to support SMEs that are developing new medical technology and devices through design consultancy, support with regulatory affairs and contract manufacturing capabilities.
- Who will benefit? Small to medium enterprises operating in the MedTech sphere.
- Why is this important? Companies with strong ideas for medical devices and technologies are often too small to support a full in-house design

Catalyst is an intensive programme of high-level mentoring and commercially-focused peer group workshops designed to turn ideas into businesses with real-world impacts. Over the next six months, the selected companies will benefit from one-to-one mentoring and commerciallyfocused workshops in their peer group of like-minded early stage science and technology businesses, and they will be able to call Southampton Science Park their business home for the duration of the programme. On completion, participants will have created an investment-ready Business Plan, Management Team Plan and Funding Plan, as well as gained the knowledge and networks needed to fast-track their growth.

Nearly 60 companies have benefited from Southampton Science Park's Catalyst business accelerator programme over the last eight years. These companies have raised over £15 million in grants and investments, with many primed for substantial growth.





Unfortunately, the majority of these devices fail, causing device-associated infections and discomfort in patients, reducing the effectiveness of clinical service and imposing a £2.5bn annual burden to the NHS. Sooba Medical has developed and tested novel and improved urological products which solve these issues.

START-UP / SCALE-UP

- Did you know? The NHS replaces at least 90,000 stents each year, at a cost of £450m.
- Ali says: "We have successfully produced a first prototype and performed a very successful pre-clinical trial. The challenge moving forward is to gain the skills and knowledge necessary to commercialise a medical device. This includes expanding my knowledge of regulatory approvals, CE marking, NICE approvals and raising funds to cover manufacturing costs."



service. Zelemiq aims to build long-term relationships with these companies to offer expertise as and when support is needed.

- **Did you know?** The global medical devices market size was valued at US\$425.5bn in 2018. It is expected to each US\$612.7bn by 2025.
- Rod says: "I was truly elated to be invited to pitch for a place on Catalyst. My knowledge of the reputation of the programme made me check just to make sure that mine really was the sort of company they would be interested in! I am expecting to learn a lot of things I didn't know and have thought about a lot of things I otherwise might not have, while meeting a lot of people who I hope will become firm relationships for years to come."



TALKING HEADS

THRFF **EXPERTS** IFWS ADRIAN BRAINE, PHILIP SHARPE, AND GARY SMITH **ARE SOUTHAMPTON SCIENCE PARK'S BUSINESS MENTORS IN RESIDENCE. WITH A CENTURY OF COMBINED EXPERIENCE OF WORKING WITH COMPANIES IN THE INNOVATION SPHERE** THE TRIO IS WELL PLACED TO ANSWER OUR QUESTION OF THE DAY: IN A YEAR LIKE NO OTHER. JUST WHAT ARE THE THREE THINGS THAT SMES SHOULD FOCUS ON RIGHT NOW?



Adrian Braine

Adrian is the founder of two companies that provide expertise in entrepreneurship, technology acceleration and go-to-market strategy and growth for companies working with cutting-edge 5G and immersive technologies. In a 40 year career, he has held international directorships, been a SETsquared Entrepreneur in Residence and regularly consults on digital industrial strategy.

Adrian advises:

"Take advantage of cheap money. The one thing we can be sure of right now is that we can't be sure of anything, so financial management of cash is key. 'Cash is King', especially if you are just trying to survive. However, now is a good time to access finance. The UK government is backing loans on very good terms and investors are looking to equities as a way to get any sort of return. Just use it wisely.

Secondly, think about change. The cataclysmic events we're experiencing now can be positive because they force change - and that creates opportunity. It resets the status quo; incumbents are no longer incumbents. It creates the chance to enter markets that you have been locked out of. So, think about that, look for where change has been forced or accelerated in the market and consider whether you want to adapt to that or change it?

Finally, strategic planning. One thing is for sure: 'normal' as we knew it will not exist anymore; the pandemic will cause permanent change. Therefore, companies that can ride out the current storms need to start thinking about what their world will look like when this is all over and we've finally left the EU. Understanding how to position the business to exploit the 'new normal' will be essential and planning this needs to start now."



Philip Sharpe

Philip is a business coach and a Director at Southampton Science Park. After nearly 20 years commercialising technology at QinetiQ, he has been mentoring early stage businesses at the Science Park for ten years, including those in the Catalyst business incubator. His broad experience spans a wide range of technologies and markets.

Philip advises:

"In three words, SMEs must focus on: customers, customers and customers! And the corollary is don't get distracted by the technology.

Just remember: there are thousands, if not millions, of people in the world who are at least as clever as your best developers and inventors. Differentiation is only derived from the unique relationships and loyalties you create with your customers – think Apple.

Customers must be able to 'get it'; to empathise with your passion. And your passion must fire up everyone in your team and permeate everything you do. Your best customers are those who promote your company for you (and forgive you when things aren't quite right). If your customers 'get it' then your investors will, too; if they can see that your company is tuned in to customers' emotional and social needs, they can see a pathway to growth and returns.

The Covid-19 pandemic has challenged society to re-think, to adapt and to solve new problems. People with problems and existential threats make needy and often articulate customers – all you have to do is listen. SMEs are agile compared to mature businesses and can more readily find and explore these new needs; pivoting customers is fast and often brings new scale-up opportunities. In short: 'tune in', develop new followings and fulfil real needs."

TALKING HEADS



Gary Smith

Gary is a specialist in early stage venture funding. Having successfully raised over £50m in capital, he has a proven track record of building high-growth software businesses from start-up through scale-up to initial public offering. As a board level business leader and coach, he works to accelerate the fortunes of a business, drive sales and improve shareholder value.

Gary advises:

"First of all, look after the cash. Make sure that you have sufficient cash to weather at least two more waves of widely anticipated Covid-19 lockdown. Those businesses operating in markets that have witnessed a dramatic decrease in demand especially must focus on prompt cash collection and also look to reduce overheads wherever possible.

Secondly, rethink your plans. Build a new three-year business plan and tune it to your post-coronavirus market. The whole world has changed and so must your business. Don't let up on sales and marketing efforts but focus and prioritise them. Some sectors are now seeing a massive increase in demand: research where these opportunities are, and act quickly to identify the parts of your business that have been negatively affected and redeploy your resources to take full advantage of new opportunities.

Finally, consider virtual territory expansion. Business to business sales teams have traditionally restricted their sales patches to geographical areas, small enough to meet face to face. However, although video conferencing has been around for years, the lockdown forced businesses to fully embrace virtual meetings - the new Zoom culture has revolutionised business communications forever. I have recently been supporting a UK start-up selling high-end complex software to a multinational corporation headquartered in the US. The sales process is fast and efficient yet there have been no face-to-face meetings. It's proven the ability to open up new markets without international travel or local sales teams."

ECOD FOR THOUGHT

Prior to 2020, many global organisations were seriously stepping up their corporate social responsibility agendas; several publicly stated their aspirations to reduce their environmental impacts beyond Net Zero to Net Negative. Has the pandemic disrupted this positive path to sustainability and resilience? We discuss this with Nicky Amos, Co-founder and Managing Director of Chronos Sustainability, a specialist advisory company with particular expertise in sustainable business and responsible investment.

Nicky, to what extent do you think the Covid-19 pandemic has affected the corporate social responsibility agenda?

Covid-19 has brought into sharp relief the interconnectedness of the world we live in and the underlying structures and human behaviours that threaten to disrupt and erode diverse ecosystems on a global scale. Its impacts on public health, and its consequences as a result of action to prevent its spread, are clear. The magnitude of this crisis forces everyone - governments, academic and financial institutions, civil society and the business community to question why Covid-19 occurred, what we could have done to prevent it, and what we can do to prevent a recurrence.

This pandemic has tested companies' resilience to change on an unprecedented scale, forcing companies to re-evaluate their business models and priorities, including their sustainability priorities. Some companies such as those in the tourism, aviation, food service and arts sectors are fighting for their very survival, with negative consequences for their employees, suppliers and customers. Others, such as distillery companies and

textile manufacturers have temporarily remodelled their businesses to produce vital supplies of hand sanitisers and personal protective equipment respectively. And thousands of companies have needed to adjust to new ways of working - learning that it is possible to operate effectively through remote working and with virtual connectivity, with reduced business travel and with fewer resources and less waste - an early step for some perhaps in how we might transition to a modern, low-carbon economy. Others have accelerated their transition to e-commerce in response to how consumers are adapting their shopping habits.

What do you see as the impacts that will take the longest to recover from? The full human and economic consequences

of Covid-19 are not yet realised and their effects are expected to endure for decades to come

Take, for example, our global food system. The intensification of agriculture in developed countries over the past 70 years has brought benefits in terms of plentiful and affordable food, but the human, animal, social and environmental costs associated with these

Nicky Amos, Co-founder and Managing Director of Chronos Sustainability

benefits have been largely concealed. The food production system, involving around 80 billion animals a year, has been designed for maximum output, with all parts of the value chain, from breeding to slaughter, primed to operate at full capacity. The Covid-19 pandemic has highlighted the fragility of this system, with mass outbreaks of coronavirus amongst workers operating in close proximity to one another in meat processing plants across North and South America and Europe.

But it is not just the immediate social and economic impact of the outbreaks that are of concern; there are multiple knock-on effects. To take one illustration, the welfare of farm animals in global supply chains will have suffered from overcrowding on farms, longer transportation times to slaughter, and emergency euthanasia.

Focusing on the food sector then, what are the key sustainability issues?

The issues facing food companies are multidimensional. With a significant proportion of the world's population denied basic access to food, shelter and clean drinking water, efforts to end poverty and hunger must go hand in hand with strategies to improve health and education, reduce inequality, and spur economic growth. Meanwhile, food companies must also take decisive action to preserve the health of our oceans and forests and transition to a low carbon economy.

Delivering systemic, transformative change on the scale needed will require a collective response – from governments, from the business sector, from investors and from civil society - in reconsidering how food is produced and the intrinsic relationship between our global food system and the natural environment on which it depends.

So what practical steps can these companies take to build a more resilient global food system?

Many food companies already have established sustainable agriculture policies and action plans aimed at improving the performance of suppliers of agricultural commodities to raise quality, lower costs and contribute to sustainable development. Food companies are also actively promoting the United Nations Sustainable Development Goals (SDGs), especially those related to ending poverty, hunger and inequality, as well as those linked to good health and wellbeing, decent work and protecting life on land and under the sea.

However, Covid-19 should also spur companies to test the resilience of their global supply chains by taking a holistic view of their exposure to risks related to the natural environment. This should include risks linked to zoonotic disease, biodiversity loss and environmental degradation.

More broadly, what, in your opinion, is the key lesson from this year?

Covid-19 has shown how, through our own actions and behaviours, we are destroying the vital habitats and ecosystems on which humanity and the planet depends. It has also highlighted the lack of resilience in our business systems to adapt in response to external threats - be these human health security, biodiversity loss or climate change.

While companies face pressing short-term challenges, there is a need to take stock of the social, economic and environmental consequences of our actions and understand the steps that are necessary for delivering systemic, transformative change in our industry sectors and in society.

Maybe we will look back in years to come and see how Covid-19 was a tipping point, reminding us - as companies, as investors, as consumers – of our place within an interconnected global system and the effects of our individual and collective actions and behaviours on society, on the economy, on the environment, and on our survival.

Which innovations would you like to see come to market that could have the biggest benefits in driving positive corporate action on the environment and the societies in which they operate? We don't know what the innovations will be. but we would challenge companies to consider how they can operate in a more sustainable way.

Covid-19 has presented an opportunity to transform our current business systems into models that are more equitable and sustainable - environmentally, economically, and socially. In the case of our food system, a sustainable model would require protection of farm and production workers, and good stewardship of natural systems and resources - building and maintaining healthy soil, managing water wisely, ensuring animal welfare, and minimising air, water, land and climate pollution.

If we are prepared to learn the lessons from Covid-19, then we can build back better.

Established in 2017, Chronos Sustainability Ltd works extensively with multinational companies, NGOs and global investors to build their understanding of the business, societal and investment implications of sustainability-related issues. Chronos develops and implements effective tools and strategies aimed at delivering systemic, transformative change.

SUSTAINABILITY

www.chronossustainability.com

Maybe we will look back in years to come and see how Covid-19 was a tipping point, reminding us as companies, as investors, as consumers – of our place within an interconnected global system and the effects of our individual and collective actions and behaviours on society, on the economy, on the environment, and on our survival.

2020 brought a great deal into focus. Many have found themselves scrutinising elements of their daily lives that they simply took for granted. Their office, for example.

Premises and facilities management teams all around the world have had to face up to a whole new range of challenges this year, head-on and with virtually no notice to get up to speed. To make matters worse, the stakes couldn't be higher: commercial resilience and the health and wellbeing of staff have depended on effective decisions and swift actions.

While some companies have embraced homeworking during periods of lockdown, even finding the transition relatively easy and productive, others have struggled to keep workforces motivated and engaged. While some businesses rallied the troops to return to their bases guickly, others remain hesitant, perhaps mindful of further disruption.

What is extremely clear is that there's no off-the-shelf, one size fits all solution: each workplace is quite different from another. And that is an incredibly good thing!

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DATA, DATA, DATA

OFFICELIFE 2.0 THE OFFICE...BUT NOT AS YOU KNOW IT

Has there ever been more research commissioned into what we think of our working environments as there has been so far this year? You name it, they've researched it. From management consultants to academics to commercial property specialists, the volume of data on how and where we work has been quite mindboggling!

Research carried out at the University of Southampton and Cardiff University¹ found that nine out of ten UK employees who have worked at home during lockdown would like to continue doing so in some capacity, with nearly half wanting to work at home often or all of the time. Yet only 41% of those surveyed said they were able to get as much work done while working at home: a somewhat alarming finding for human resource-intensive operations.

OFFICE...BUTNOTAS YOU KNOW IT THE OFFICE...BUTNOTAS YOU KNOW IT

'www.southampton.ac.uk/news/2020/08/homeworking-in-the-uk.page

These figures are aligned with findings by McKinsey in the US. 'Many employees liberated from long commutes and travel have found more productive ways to spend that time, enjoyed greater flexibility in balancing their personal and professional lives, and decided that they prefer to work from home rather than the office', it reported.

Meanwhile, a report by Savills² found that 89% of workers still believe that the office plays a key role, with respondents believing that physical office space remains a necessity for companies to operate successfully. This is particularly important to 18-24 year olds who displayed a clear preference for the office; a key consideration for tech companies that constantly look to attract and retain the next generation of talent.

The same Savills survey also addressed geographical preferences. It found that whilst the highest proportion of respondents (62%) currently work in towns or cities, it's likely that this figure will drop by 23% in the future with people expressing a clear preference for working in rural locations.

The pros and cons of home working versus office working will continue to be debated on a macro scale and within individual companies, but there is one recurring theme across much of the research carried out: office space and how it is used will evolve, and so too must leadership teams' thinking on the matter.

McKinsey sums it up well: 'The answer, different for every organization, will be based on what talent is needed, which roles are most important, how much collaboration is necessary for excellence, and where offices are located today, among other factors. Even within an organization, the answer could look different across geographies, businesses, and functions, so the exercise of determining what will be needed in the future must be a team sport across real estate, human resources, technology, and the business. Tough choices will come up and a leader must be empowered to drive the effort across individual functions and businesses. Permanent change will also require exceptional change-management skills and constant pivots based on how well the effort is working over time.'3

EVOLUTION REVOLUTION

So, how might this office evolution manifest itself?

Key concerns arising from widespread home working include productivity decline, an an erosion of corporate culture the common values that glue a team together - fewer moments of serendipitous creativity offered by off-the-cuff conversations, and a slowing of people development and talent spotting.

LOCATION



Given that high levels of employee satisfaction are closely linked to high levels of productivity, the need for employees to feel connected is fundamental. Some suggest that offices of the future will need to feel more like social hubs. These would support team working, faceto-face meetings and events that enhance shared learning, career development and the reinforcement of a company's brand and culture. Small meeting rooms with high quality audio visual and video conferencing capabilities would sit side by side with dedicated quiet and creativity zones.

A greater focus on nearby amenities, which staff often cite as important to them in feeling supported, is also to be expected. In its 2019 article⁴ on how to future proof workplaces, the Royal Institution of Chartered Surveyors suggested that, increasingly, staff choose to work where gym membership, for instance, is offered. It also highlighted that humans need to interact with nature and fresh air and called on companies to consider how they could incorporate more outdoor space into their working environments.



LOCATION

MOVING FROM OFFICE TO SPACE

Nine23 changed the way it works and evolved its business home to suit. CEO, Stuart McKean, shares his experience.

"Like all businesses, we quickly moved from the office to fully remote, home working at the start of the COVID-19 pandemic. However, as we deliver secure remote working to our clients, it was very easy for us to practise what we deliver and shutting down the office was a very ssimple exercise – one, in fact, we had practised in January as part of our business continuity ISO re-certifications.

What was a surprise was the little things that you take for granted in the office - desks, chairs, Wi-Fi, monitors, chatting to colleagues... "I have a beanbag in my room to work from" was not going to cut it!

What was, and still is, critical to home working is our communication plan. In those early days it was clear that we are could cope and continue to deliver as if nothing had changed, but we had to maintain communications, so we increased our daily stand-ups to twice-daily video check ins. Our morning stand-up covered the same format but our afternoon check-in was much more informal and focused on how we were as individuals.

Once we had settled into the home working routine it became apparent that work life was going to change for ever and, as an SME, we have the ability to act in an agile way. So, rather than focus on 'the office' as such, we focused on things that worked and things we wanted to change.

As a team, we realised we could operate remotely and securely without an office. We all missed certain elements of the office and we all enjoyed certain elements of working from home. Commuting was a major element that no one missed but the social interaction with our team mates was definitely the number one element we all missed.

One of the great things about being at Southampton Science Park is that the management team understands how tech companies operate and that flexibility is needed. We worked with them to move from 'office' to 'space': a space for collaborative work when needed and also one for those who cannot work from home.

So, we have a space in which to work with each other on projects, sales bids, strategy sessions etc. but we use it very differently to the old office. A business needs a home and our new 'space' is our home."

Whilst 62% currently work in

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owns or cities, it's likely that the future will drop by 23% in

for working in rural locations.

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LOOKING TO THE FUTURE

Promega had been at Southampton Science Park for over 25 years when it decided to design and build a bespoke new UK headquarters. The 16,000 sq. ft. building was designed to be environmentally friendly, functional and beautiful inside and out.

Sean Donnelly, Operations Director, Promega UK, said: "When we were planning this development, we were keen to stay on the Park; the plot on Benham Road was an ideal location. The new building, containing commercial offices, research and development labs and our cold storage facility, reflects the attention to detail and planning which we undertook with our parent company, Promega Corporation.

The result is a construction which reflects our corporate style and ethos, whilst creating something which is truly unique. Our central themes in the design of the building are:

INSPIRATION

Imagine you worked for a company that has slides instead of stairs, a medieval maze to stroll through during your private meditation, or perhaps an airline bed to sit on whilst brainstorming ideas with your colleagues...

In her book, 'I Wish I Worked There!', Kursty Groves reveals some of the world's most inspiring and innovative places, going behind the scenes of many famous brands who place innovation and creativity at the heart of their working culture, and exploring how this logically leads to better business results.

At Lego Group HQ, for example, play is not restricted to brick-building sessions or co-creation with children, it's part of the DNA. 'Hotspots' - areas furnished with games such as table football – pop up among team spaces throughout the studio, encouraging people to relax and connect with colleagues. This type of playfulness relies upon a spirit of trust, something that is reinforced by the physical openness and relaxed atmosphere of the working environment. The energy and mood of the place throbs throughout the day.

CREATING SPACE FOR GROWTH

Critical Software expanded its main UK office at Southampton Science Park in a move which reflected the company's continued growth and strategic presence in Britain.

Adding another floor to its previous offices in Benham Road, the company increased capacity from 40 to 60 desks and took on a 'space' theme, alluding to the company's long history in the industry and the fact that NASA was its first ever client.

The move also enabled Critical Software to incorporate larger social and leisure areas, a new kitchen and a patio where staff can enjoy the lush landscapes of the Science Park and its surrounding woodland.

4www.rics.org/uk/news-insight/future-of-surveying/sustainability/futureproof-office-buildings/

LOCATION

- The creation of a building capable of operating with a carbon neutral footprint. New building technologies help achieve low energy consumption, low carbon emissions and water conservation.
- Establishing an environment that nurtures creativity, self-discovery and individual growth; one where employee health and wellbeing is an integral part of our daily activities.
- A facility enabling us to foster deeper relationships with our customers, suppliers and collaborators, sharing with them the culture, ethos and capabilities of Promega.
- Our desire to share our knowledge of life science with our local community and to educate and enthuse future generations of life scientists."

In contrast, perched on top of a decapitated hill in southern California, the headquarters of sunglasses manufacturer Oakley could be mistaken for a post-apocalyptic fortress from an alien planet. It's aptly described on the company's website as 'a place of reinforced blast walls, product torture chambers and the padded cells of mad science'. Provocative, industrial and iconic, it conveys the brand's bold personality and virtues to all who dare to enter. Everything at Oakley is about pushing the envelope, being bold, cranking up the volume.

ON THE PARK

News from the Science Park Community



Securing IoT Networks

Multiple Access Communications (MAC) is participating in SYNERGIA, a £2.2m Innovate UK-funded project led by Toshiba.

SYNERGIA brings together a world-class collaborative effort to make Internet of Things (IoT) networks more secure. This consortium covers all three tiers of IoT architecture - endpoints, edge and backend - and aims to devise, develop and demonstrate a secure endpoint-to-core IoT platform for large scale networks of low-power, resource-constrained devices.

MAC will lead use case and end-node development, bringing its expertise in IoT applications and wireless sensor design to the project, alongside experts in secure configuration management for IoT systems (Configured Things), security architectures for battery-powered resource-constrained devices (loetec, University of Bristol), distributed artificial intelligence and edge processing (Smartia and Toshiba Europe).

Multiple Access Communications is a contract research and development company specialising in the analysis, evaluation, design and development of advanced mobile radio technologies and equipment. It has been serving the public safety communications community, pioneering IoT and the development of wireless sensor networks for over 15 years.



www.macltd.com

xim Wins Funding

xim has been selected from a field of over 530 applicants to receive a share of £50m government funding to advance its Lifelight technology.

Lifelight allows completely contactless measurement of vital signs: heart rate, blood pressure, respiration and oxygen saturations. It does so in just 40 seconds using a patient's standard smartphone or tablet, with no additional hardware. The technology has the potential to enable safer, easier and more effective remote triage and monitoring. Lifelight's funding was won to further develop the application for cardiovascular disease screening via contactless blood pressure readings.



The Secretary of State for Health, Matt Hancock, announced Lifelight as one of the first winners of the AI in Health and Care Award, which aims to accelerate testing and implementation of new technologies for the NHS. The NHS is committed to becoming a world leader in the use of artificial intelligence and machine learning to achieve a range of benefits, from faster and more personalised diagnosis to potential efficiencies in screening services.

"We are delighted and honoured to be selected for this prestigious award. As a Southampton-based company, we are proud of our UK heritage and excited to be part of this innovative programme - one which promises to accelerate the pace of AI adoption in healthcare. Lifelight not only addresses the critical need to regularly monitor vital signs, it also gives clinicians the ability to do this remotely, safely and at scale, critical to Covid detection and management of long-term conditions. This is innovative use of AI, not just transforming but helping to save lives," noted Laurence Pearce, CEO and founder of xim.



www.lifelight.ai

Transforming Forensic Science

The newly established Forensic Genomics Innovation Hub (FGIH) has chosen Southampton Science Park as its home with the vision to transform the use of DNA in forensic science.

The focus is on the provision of nextgeneration sequencing technology using the fully validated MiSeq FGx platform to the UK's criminal justice system and all those involved in research and academia, passionate about expanding the UK's reputation in forensic science. The technology is already well respected in the clinical genetics market, thanks to the 100,000 Genomes project and the implementation of next-generation sequencing into routine diagnostics.

The FGIH is a 'proof of concept/centre of excellence' facility where projects and mutually beneficial partnerships produce foundational research that will lead to

innovations and deployable solutions in the future. Driven by innovation, it is both creative and adaptable, with a commitment to develop new solutions and positive outcomes. No longer will DNA be an adjunct to crimefighting, but a proactive intelligence tool.

A small number of tests with multiple applications will be offered by the Forensic Genomics Innovation Hub including:

- STR and SNP sequencing for specialised forensic casework and crime stain analysis in complex cases, chimerism testing posttransplant, sample mix ups, mass disasters and missing persons.
- Mitochondrial DNA testing for compromised/degraded DNA, diagnosis, and inheritance of mitochondrial disorders.
- Forensic genetic genealogy in cold cases and court appeals.
- Non-invasive prenatal paternity testing.

Fast-Tracking Covid-19 Tests

MicroGEM has been awarded over \$40m to expedite the launch of its molecular diagnostic test.

The funding was awarded in the United States by the National Institutes of Health's (NIH) Rapid Acceleration of Diagnostics

(RADxSM) initiative, which seeks to significantly increase the number, type and availability of tests by millions per week.

MicroGEM's Covid-19 saliva test provides laboratory-guality results in 15 minutes, allowing non-medical personnel to obtain rapid, on-site detection without a laboratory. The system detects SARS-CoV-2 in saliva, simultaneously with influenza types A and B. Based on patented enzymatic RNA extraction technology, the system is a simple approach to quickly detecting and managing infectious disease.

"We are pleased to be working with the NIH to accelerate the launch of this new platform to detect Covid-19," said MicroGEM CEO, Jeff Chapman. "This funding enables us to leverage the technologies currently in our pipeline, pivoting to address the urgency of this pandemic for a safe and expedient way to expand the availability of Covid-19 testing to those who need it."



www.microgembio.com

NEWS



FORENSIC GENOMICS INNOVATION HUB

The Forensic Genomics Innovation Hub will apply all the capabilities of modern sequencing and genomics to forensic science and human identification. The team is a unique, well experienced blend of forensic science and molecular clinical genetics, perfectly placed to deliver the technology so widely used now to the forensic community, which, in the past, has been previously underserved and will benefit enormously from this technology. The Forensic Genomics Innovation Hub is essentially an entirely new approach to becoming involved in the technology of forensic genomics, capable of meeting the needs of a multitude of industries and clients.

Nordson Acquires vivaMOS

vivaMOS, a leader in high-end, large-area CMOS image sensors, has been acquired by Ohio-based Nordson Corporation.

The company will become part of the Test and Inspection division within Nordson's Advanced Technology Solutions segment, building on its strategic objective to enhance its test and inspection capabilities for diverse end markets.



vivaMOS, established in 2015 as a spinout from the UK's Science and Technology Facilities Council, moved to Southampton Science Park in 2016. Since then, it has won several prestigious awards for its unique technology and commercial success, and it has moved premises on the Science Park three times to accommodate its growth. The company plans to remain at Southampton Science Park.

Dan Cathie, Business Director, X-ray Components, said the acquisition will serve to accelerate the promising growth to date: "We are very excited about this acquisition by Nordson, which will make us bigger, better, faster. We look forward to delivering our ambitious plans for the new combined X-ray Components business further and wider together, thanks to their market reach and strong brand image."



www.vivamos.co.uk

Revolutionising **Chemical Sensors**

SouthWestSensor has joined the Southampton Science Park community.

Founded in 2015 by world-renowned expert in microfluidics, Dr Xize Niu, the company has developed an innovative, nanodroplet microfluidicsbased platform that requires only minute volumes of liquid reagents for autonomous, continuous and highly accurate measurement of chemical and biological molecules.

SouthWestSensor's approach is expected to be of significant importance in health and environmental spheres. In the health arena, its solution offers low-cost, wearable chemical sensors for fast, continuous, real-time monitoring of biomolecules in tissue fluids. This accelerates understanding of fundamental physiological and pathological processes, and empowers healthcare professionals to make faster, potentially life-saving interventions, while avoiding inaccurate diagnosis and poor treatment.

Meanwhile, the company's fully submersible and portable water sensors are perfectly suited for the continuous monitoring of nutrients and pollutants in fresh and sea water at lower cost and with a lower environmental footprint than traditional methods of water sampling. Applications range from environmental monitoring to wastewater process control.



Dr Oliver Hofmann, Chief Executive Officer, commented: "With proven technology capable of rapid deployment, we are at a pivotal stage of company development. That's why we are incredibly pleased to be locating to Southampton Science Park, a move we are confident will support our growth plans in multiple ways."



20 in 2020

ITDev has celebrated its 20th anniversary.

Founded in 2000 by Bruce Mitchell and then joined by Andy Culmer in 2005, ITDev has successfully delivered more than 300 projects and has a client base of over 50.

Despite economic downturns and the Covid-19 crisis, ITDev's growth has been steady as it has adapted and continued to innovate on behalf of its clients in the video and broadcast industries. It has further diversified into other markets including telecommunications, industrial, aerospace and automotive sectors.

From humble beginnings in the front room of Bruce's house, the company has occupied offices on the Science Park since 2006 and now has a team of 21 permanent, highly skilled software and hardware engineers. There have been no redundancies over the years, something founder Bruce Mitchell is very proud of. He commented: "Our low staff turnover is testament to our strong company culture and values. Our staff enjoy our beautiful surroundings at the Science Park, making full use of opportunities for lunchtime walks around the nature reserve, visits to the coffee shop and networking with other companies here.

"Last year we were awarded 'Tech Employer of the Year' at the South Coast Tech Awards, which I'm personally extremely proud of. We have a great team who are passionate about their work, consistently developing high quality products which ensures our client satisfaction remains very high."



www.itdev.co.uk

https://southwestsensor.co.uk/

Addressing African Poverty

Semantic has helped to address poverty in Rwanda by providing charitable organisation, the Amakuru Trust, with a new mobilefriendly, search engine-optimised website.

The organisation supports education, humanitarian and health projects across Rwanda. Its Chairman, Alan Booth, commented: "Our new website has engendered the success of this appeal beyond our initial expectations. We currently stand at an incredible 95% of monies raised towards our target of $\pounds_{3,000}$, and it is no coincidence that the impact of the website and the appeal have come together in a dramatic surge of support for the targeted children and families we are helping in Rwanda. And as dramatic as it may sound, the Semantic team has literally saved lives in Rwanda and we are all very much in their debt."

Neil Lewin, Founder and Owner of Semantic, said: "Whilst times are tough in the UK at the moment, we can only begin to imagine the challenges faced in communities throughout Africa. We are hugely proud to have been able to partner with Amakuru to get their website working for them to help fund vital work. Since its launch in April,



we're thrilled to have made such an impact to the charity and we hope the new site will drive donations and online engagement for the Trust for many years to come."





DUCKDUCKGO In a flap about privacy on the net? Migrate to DuckDuckGo.

What is it?

DuckDuckGo is on a mission to raise standards of trust online.

Simply put, it's a search engine that guarantees that your search is private. Its browser mobile app and desktop extension both come with a tracker blocker, encryption enforcer and private search engine, thus providing all the key privacy protection tools to search and browse all in one simple package. DuckDuckGo doesn't collect data from you and the IP address of every user remains hidden and protected. Nor does it use cookies to follow you across the internet and figure out what other stuff you might be interested in.

Why is it important?

In their words: "Using the Internet these days feels like being haunted by the ghosts of browsing past. The shoes or headphones you shopped for yesterday are following you around relentlessly today. These creepy ads are powered by hidden trackers, lurking behind most websites. And unfortunately, your shopping habits are just the tip of the iceberg of what they know and can exploit. In addition to shopping history, trackers can pick up your location history, search history, browsing history and more, and from those infer your age, ethnicity, gender, interests and habits. Companies collate this personal data into a detailed profile, continually auctioning you off to the highest bidders."

Google trackers, for example, have been found on 75% of the top million websites.



DuckDuckGo has proven that search engines don't need to profile their users to provide them with the information they seek.

Where did it come from? Founded in 2008, DuckDuckGo was hatched out of a few servers in a dusty basement as a self-funded operation by founder, now CEO, Gabriel Weinberg. Weinberg is a serial entrepreneur who has previously founded other internet-related companies. He is also an active angel investor, author and commentator.

Not afraid to take on the mighty Google, DuckDuckGo went public in a big way in 2011 via a billboard in Google's backyard, telling the world simply "Google tracks you. We don't." By February 2012, the challenger had reached one million searches a day. 483 days later, it was two million, and, just eight days

INSTANT EXPERT

after that, three million. DuckDuckGo had taken flight.

Where is it going?

The company has secured \$13m in funding and its estimated net worth is \$901m.

While other major search engines saw drops in organic search visits in 2019 (for instance, a 26% drop for Bing), DuckDuckGo recorded an increase of 49% across all devices and a 64% rise on mobile devices.

By June 2020, DuckDuckGo was recording a whopping 50 billion searches each day but, because it doesn't track them, it's impossible to know how many users there are! (The best estimate, based on search volume, is over 50 million people).

In the context of an ever more serious list of data breaches, public interest in online privacy is growing, with people wising up to just how much information faceless corporates hold about us. Increasingly, we are unwilling to compromise our privacy for more personalised experiences.

As a result, DuckDuckGo is driving the implementation of search preference menus on mobiles (user testing has shown that Google would lose about 20% market share if people were given the chance to choose). Its privacy mission is further supported by a charitable donations programme which funds diverse organisations across the globe that strive to improve online privacy and competition.

WELLBEING

COULDEIn Traynar, osteopath, expert on wellbeing,
podcaster, wild swimmer and Grandad to seven,
shareshis thoughts on how we can sleep well
in times of stress – a critical factor in boosting
immunity over the winter months.

Boost your immunity through better sleep

There is no doubt that one of our greatest defences against the current outbreak of the coronavirus is our very own immune system.

Although the practical advice of a) wash hands thoroughly, b) remain physically distanced and c) cover the face when in close proximity is sound, in my opinion it needs ramping up to the power of ten with "maintain your immune system by a) paying attention to the quality of your sleep, b) lowering your stress levels, and c) maintaining a good diet with plenty of vegetables and fibre".

There's a lot of ground to cover there, so I'm going to focus this piece to give you some practical tips for the first point, better quality sleep. In one sense it's hard to treat sleep as an isolated topic because it is integrated with so many other factors of our lives. Why? Sleep is designed to be natural. It's how our system rebalances and repairs. And that is exactly why it's so easy to take sleep for granted.

ZZ

Sleep is designed to be natural. It's how our system rebalances and repairs. And that is exactly why it's so easy to take sleep for granted zz So, my first tip is: make quality sleep your top priority now. You don't need a sleep gadget to tell if you're not sleeping well. If you're getting disturbed sleep, finding it hard to get out of bed in the morning, your phone is the first thing you reach for on waking and the last thing you touch at night, if you're feeling irritable during the day, reaching for coffee throughout the morning, not being as productive as you used to be, it's time to act.

What is degrading your sleep? It could be general stress levels, physical pain, eating too late, drinking alcohol, too much screen time and blue light, shift work, a snoring partner... My next tip is therefore to – right now! – do a quick audit of what is affecting the quality of your sleep. And decide on the corrective measures you need to take.

If you want to make an immediate and huge difference to sleep quality – warning! this is gonna be tough! – quit drinking alcohol and make your last meal four to five hours before your bedtime (and no snacks!) Ouch! I knew that would hurt but you won't know how much this helps until you try it.

Next, strive for better rhythms in your day/week/month. Nature has its own rhythm and we can tune into it, and ours! Get up at the same time every day (no lie-ins); go to bed at the same time and prepare for that by winding down at least an hour before. Review your work/ life balance regularly: make sure your UPstress levels are constantly balanced by great DOWN-times of relaxation, fun and play.

Improve your bedroom – think of it as your sacred R&R space. Make it as dark as possible and as quiet as possible with good blinds, no electrical light, computers or gadgets, and, of course, a comfortable bed. Make it really inviting.

And finally, if you are disturbed during the night, stay as neutral about it as you can. Try not to release any negative emotion about it as this will spike your adrenaline and you could well be awake for hours. If your adrenaline is triggered in this way, get out of bed, burn it off with some light exercise, and get back to sleep!!

Sweet dreams z z Z.

breakthroughconsulting.uk



Great Resources: • Sleep - Nick Littlehales

- Fast Asleep Dr Michael Mosley
- Why We Sleep Matthew Walker
- Or email me as I have loads of further information plus another 60 strategies for improving sleep! ian@ breakthroughconsutling.uk



WELLBEING



stage bowel cancer, the cause of most cancer-related deaths in the Western world. Non-invasive, inexpensive and accurate, the technology is set to transform patient experiences and outcomes.

The multiple award-winning CanSense participated in Southampton Science Park's 2019 Catalyst business accelerator programme. www.cansenseltd.com

NEWS FROM

Southampton



As well as aircraft, gas turbines are used to power trains, ships, electrical generators and pumps. The UK is one of the technology and market leaders globally in GTE manufacturing.

The Laser Imaging of Turbine Engine Combustion Species programme, led by the University of Strathclyde, aims to deliver transformational combustion measurement and modelling tools to enable the development of low emission engine designs and evaluation of new low emission fuels, leading to reduced environmental impact. Sustainability and the need to minimise emissions continue to be significant global issues, highlighted by drastic and urgent government-led reduction targets.

Examining Earthquakes

Scientists from the University of Southampton and Imperial College London have tracked a 'boomerang' earthquake in the ocean for the first time. Understanding how faults rupture and the physics involved will help researchers create more accurate predictions of future earthquakes and inform early-warning systems.

Earthquakes occur when rocks suddenly break on a fault - a boundary between two blocks or plates. During large earthquakes, the breaking of rock can spread down the fault line, but now there is evidence of a new kind of earthquake where the rupture initially spreads away from initial break but then turns and runs back the other way at higher speeds.

The team made use of a new network of underwater seismometers to monitor the Romanche fracture zone, a fault line stretching 900km under the Atlantic near the equator. Here, they recorded and tracked a magnitude 7.1 earthquake. Initially, the rupture travelled in one direction before turning around midway through the earthquake and breaking the 'seismic sound barrier', becoming an ultra-fast earthquake. The team believes that the first phase of the rupture was crucial in causing the second, rapidly slipping phase.

Dinosaur Discovery

A study by palaeontologists at the University has found that bones discovered on the Isle of Wight belong to a new species of theropod dinosaur, previously unknown to science.

The bones are from the neck, back and tail of the new dinosaur, which has been named Vectaerovenator inopinatus. The name refers to the large air spaces in some of the bones, one of the traits that helped the scientists identify its theropod origins. These air sacs, also seen in modern birds, were extensions of the lung, and it is likely they helped fuel an efficient breathing system while also

GREAT MINDS



Engine Emissions

The University's expertise in optical fibre fabrication, fibre laser sources and mid-infrared fibres will contribute to an £8m research programme which aims to reduce the environmental impact of aviation and power-generating gas turbine engines (GTEs).





making the skeleton lighter. The dinosaur lived in the Cretaceous period 115 million years ago and is estimated to have been up to four metres long.

The group's findings will be published in Papers in Palaeontology, co-authored by members of the public who discovered the fossils. They were found in 2019 in three separate discoveries, two by individuals and one by a family group, who all handed in their finds to the nearby Dinosaur Isle Museum at Sandown.

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