

ALUMNI AND FRIENDS // SPRING 2018

# nonesuch<sup>n</sup>



**Cybersecurity**  
Humankind vs machine

**Virtual touch**  
A look at Ultrahaptics

**Back to the future**  
Reinventing libraries

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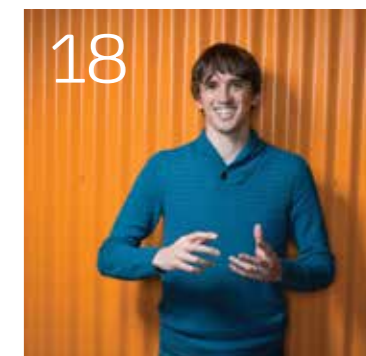
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Robotic skin

## Fusing biochemistry with soft robotics

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University

## Bristol Futures

This spring, the University launched Bristol Futures, an exciting new initiative that enhances our students' experience through a range of innovative learning resources and extracurricular activities.

In addition to their degree subject, students will be able to engage with three themes within a range of activities, to investigate some of the major opportunities and challenges facing our generation: Innovation & Enterprise, Global Citizenship, and Sustainable Futures. Students will also have enhanced opportunities to engage with local communities and employers, helping them to develop and apply their skills in a non-academic context, broadening their horizons and preparing them for their future careers after graduation.

Bristol Futures Academic Lead Professor David Smith said: 'Our new

range of online courses is perfect for all students or returners to education who want to practise skills or to broaden their learning experience. With a strong Bristol theme I'm hoping that learners will benefit from the range and breadth of expertise on offer, with the chance to discuss ideas with fellow students from across the globe.

'The courses have been designed after feedback from Bristol employers on the skills that are important to them – such as personal effectiveness and wellbeing; engagement and influence; and creativity – in partnership with Bristol Learning City.'



University

### The best in the West

The University of Bristol was ranked the best university in the South West for its student experience, according to a new league table.

The University Compare Annual Student Experience Awards are based on nearly 10,000 student reviews from institutions across the UK and look at four key elements: institute and course, accommodation, employment prospects, and social life. Bristol was ranked 10th overall with a score of 4.2 out of 5, and 100 per cent of students surveyed would recommend studying at the University. It was also ranked as the fourth best university for student experience in the Russell Group – a group of 24 world-class, research-intensive universities in the UK.



Alumni

### New Year's Honours

From artists to volcanologists, 13 alumni and staff were recognised for their extraordinary achievements in the Queen's New Year's Honours 2018.

Among those listed were Professor Stephen Sparks CBE for services to volcanology and geology, and Professor Bernard Silverman, whose research has ranged widely across theoretical and practical aspects of statistics, for public service and services to science.

Research

### Trial and error

In the largest trial ever conducted, Bristol scientists find that inviting men with no symptoms to a one-off PSA test for prostate cancer does not save lives.

Prostate cancer is the second most common cause of cancer death in men in the UK, but there is no national screening programme. However, men over 50 can ask their GP for a PSA test. The CAP trial, funded by Cancer Research UK, is the largest trial ever to investigate prostate cancer screening, and found that offering the test to men with no symptoms of prostate cancer does not save lives after an average follow-up of ten years. The results highlight many issues with the PSA test, including failing to detect some aggressive and lethal prostate cancers, illustrating the need to find better ways to diagnose.



Student

## A place of possibilities

Having left school at 13 with no qualifications, Joshua Greenidge thought a university education was beyond his reach – until he saw a YouTube video.

The 28-year-old struggled at school due to his dyslexia and was home schooled throughout his teenage years. Josh learnt to love reading and learning, but with no GCSEs or A-Levels he found his education limited to lectures on YouTube. Now, thanks to stumbling across a video about the Foundation Year in Arts and Humanities at the University, Josh became one of seven students to win an Alumni Association Student Award in recognition of overcoming personal adversity and making an outstanding contribution to the University or community.

Research

### Beer into fuel

Chemists at the University have made the first steps towards making sustainable petrol using beer as a key ingredient.

There is an urgent need for sustainable alternatives to fossil fuels. One of the most widely used sustainable alternatives to petrol is bioethanol, but it has lower energy density, mixes too easily with water and can be corrosive to engines. A better fuel alternative is butanol, but it's difficult to make from sustainable sources. Scientists from Bristol's renowned School of Chemistry have found that their catalysts will convert the ethanol in beer into butanol, demonstrating a key step in scaling the technology up to industrial application and everyday use.



News

University

**1 Running the show**

The University's Theatre Collection is one of the largest archives of British theatre history and live art. It was awarded Archive Service Accreditation from The National Archives, making it the first and only university museum, and just the fourth museum in the country, to receive it.

Research

**2 A 200-year-old mystery**

With the help of Bristol's world-leading scientists, Sir David Attenborough (Hon LLD 1977) investigated the life – and death – behind a 200-million-year-old fossil in his latest documentary for the BBC, *Attenborough and the Sea Dragon*.

Student

**3 Unleashing potential**

This summer, Engineering students from the University of Bristol will be working on the Gromit Unleashed 2 sculpture trail, making it the most innovative sculpture trail yet.

Alumni

**4 Deeds not words**

23-year-old Liv Little (BSc 2016), founding editor-in-chief of *Gal-dem* – an award-winning magazine and creative collective comprised of over 70 women and non-binary people of colour – was named by *Vogue* magazine as a 'new suffragette' in recognition of her fight for women's empowerment (Liv is on the far left of photo 4).

University

**5 Vote 100**

As part of a national campaign to celebrate the 100th anniversary of the first women in the UK being given the right to vote, the University took part in a special lantern parade, lighting the Victoria Rooms, which hosted Annie Kenney and Emmeline Pankhurst during meetings of the Women's Social and Political Union.

Alumni

**6 Watch this space**

Anne McClain (MSc 2005) beat more than 6,100 other applicants to be part of NASA's 2015 class of astronauts – the first graduating class in which the group was evenly split along gender lines. NASA announced she's scheduled to launch into space for the first time later this year.





Alumni

**In a year when we're celebrating 100 years of some women getting the vote in the UK, *Nonesuch* takes a look at pioneering women in the School of Physics.**

# The legacy of Physics lives on

When Veronica Macmillan started life as a Physics student at Bristol during World War II, little did she know that over 70 years later she would be helping new generations of physicists with their ground-breaking work by leaving a legacy to the School.

Taking advantage of the University of Bristol's longstanding openness to diversity, Veronica started studying for her BSc in 1942 as one of only a handful of female students of the 100 or so in her year. Her father had died when she was just ten years old, but she did not allow the tragedy experienced as a young girl to derail her ambitions for a higher education. Today we're well aware of the importance of bursaries and scholarships for amazing students who might not otherwise get the chance to study, and in the 1940s the need for this assistance was also recognised. Veronica was awarded an Education Board Grant for her time at Bristol and travelled to study every day by bus from Bath.

Veronica fondly remembered Professor Arthur M Tyndall, known as the 'Father of the School of Physics'. Of other lecturers she recalled that their handwriting could be difficult to read – one in particular making little distinction between his Us and Vs, thus making his formulae very difficult to understand!

As well as attending to her studies, Veronica played her part in the war effort, together with several of her fellow students who worked at the nearby Badminton Estate in South Gloucestershire. She recalled seeing Queen Mary who was sequestered there at the time. And while Veronica was working at Badminton, staff in the School were also doing their part, looking at the use of radar in the war.

Although she loved her time at the School of Physics, Veronica did feel that she missed out on the social aspect of

## 'As soon as I came to Bristol I thought it was a place where I could live and thrive'

**Astrid Blee**

being a student, as she could not afford to stay in Bristol and went to and from her home in Bath. She did however manage to join her classmates at the refectory, and later in life could still recall the novelty of eating pink semolina pudding!

Upon graduating with her BSc in Physics, Veronica completed her teacher training – also at Bristol – and spent her life working at the convent school in Bath which she herself had attended as a child. Not only did she give back to young children as an educator, on her death last year she bequeathed a large legacy to the School of Physics, so that other bright young minds could carry on the work that she herself had so enjoyed.

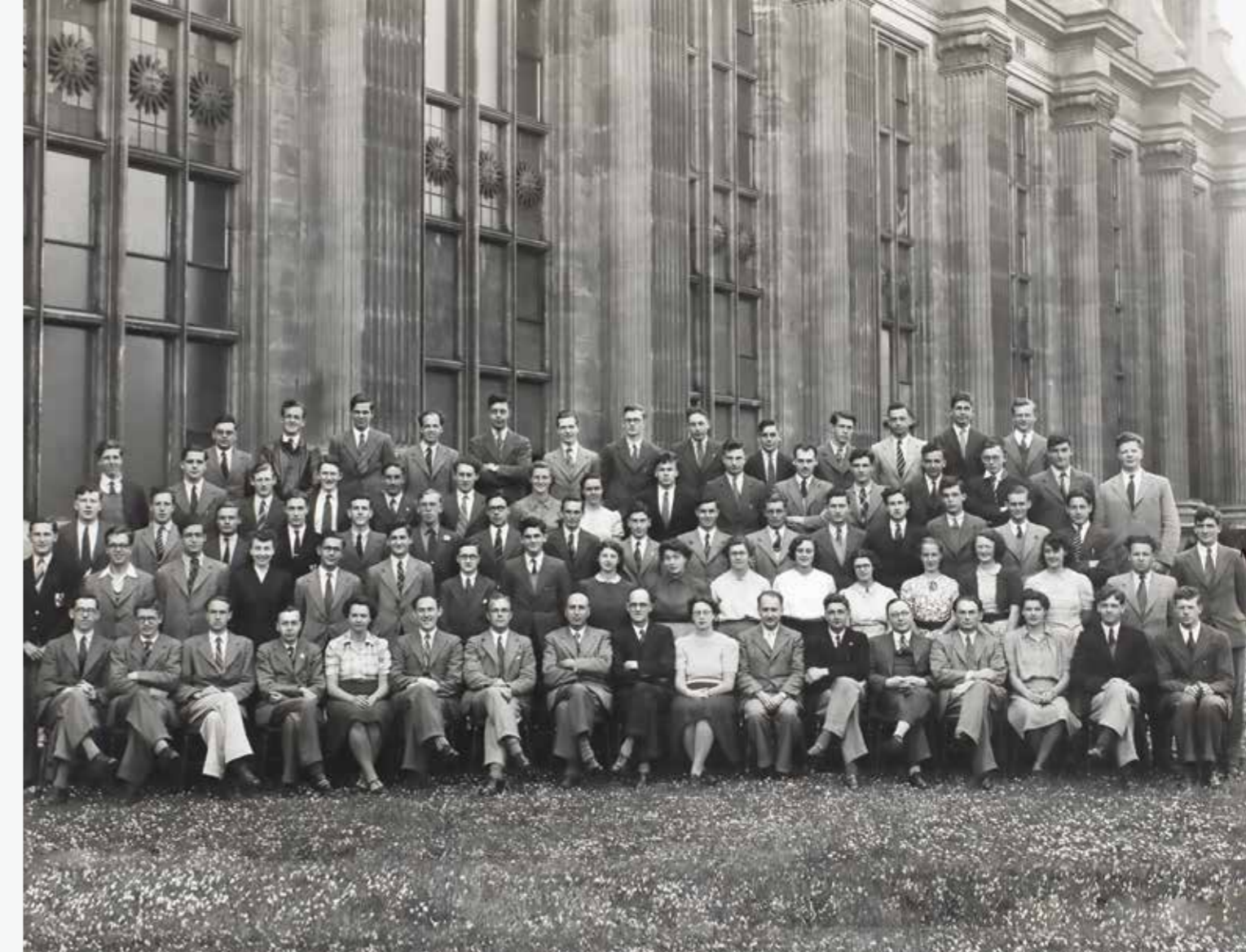
One of those bright minds is Astrid Blee (MSci 2017), currently studying for her PhD in Physics, in an environment very different from that of Veronica's. Despite seeing Bristol at its windy, rainy wildest on a post-offer day at the University, Astrid was still struck by how beautiful and inspiring the campus and city was.

While Veronica's time at Bristol might have been overshadowed by the planes of war, 22-year-old Astrid's research is looking at how to make civil aviation safer, as well as better for the environment. The Rugby native's fully funded PhD work looks at 'Non-destructive detection

**Opposite** Members of the Kings College (London) Maxwell and University of Bristol Physical societies of 1942-1943

**Right** Astrid Blee, PhD Physics student, following in the footsteps of legator Veronica Macmillan (BSc 1945)

We are holding an event this summer about leaving Legacy gifts to support Physics at Bristol. If you would like to know more about the event then please contact Jenny McGee on +44 (0)117 394 1045.



of corrosion on in-service gas turbine components.' In a nutshell, she's looking at ways to accurately detect ahead of time when an aircraft's turbine blades are about to crack. Currently there is no accurate way of measuring this, so blades are 'retired' long before their life span has ended in order to meet stringent safety regulations. However, this does mean that it's not great news for the environment to keep replacing the blades unnecessarily.

So, what is it that attracted Astrid to physics? 'What I really love about my area of physics is applied problem solving. I like taking a real-life problem and looking for a way to solve it.' Unlike Veronica, Astrid has lived in Bristol since starting her undergraduate degree here and has been able to take advantage of the social life as well as academia. Her problem-solving mind extends from physics to one of her favourite hobbies – rock climbing. 'I find it very mindful. You start at the bottom of the wall and your only goal is to get to the top. Working out how to get to the top, particularly when it gets more difficult – you can't just use brute strength. You have to think about the problem and how you can solve it. And if that doesn't work, try again.'

And what is it that makes the University of Bristol's School of Physics so great? According to Astrid it's the grand long-term vision that what seems elusive and

theoretical now will go on to make enormous contributions to society: 'Researchers who are working on new theoretical physics are laying the foundations now for what's to come in the future. This maths can and will be applied to real world problems. You need a long-reaching view, which Bristol has, to be confident that it will be of great importance in the future. Take quantum physics. Laying the groundwork for that was started 100 years ago, and now we're moving towards quantum computing and quantum optics and things that will start to have real world applications. Bristol is nurturing what may seem to some like a lot of theory, but we have the vision that it will be used in the future.'

Bristol's School of Physics has been making its mark on science for over a hundred years, including turning out several Nobel laureates. It is recognised worldwide for its pioneering research in a wide range of areas, including: quantum mechanics, nanoscience, quantum information science, semiconductors, condensed matter and metal physics, cosmic ray and astrophysics, glaciology, X-ray interferometry and topological optics. Veronica's legacy will ensure that future students of this esteemed School continue to push the boundaries of science ever further forward. Astrid is just one of many at Bristol taking on the challenges of the world we live in today. ●

**Traditional notions of libraries are changing. The University has announced plans for a new £80 million library to be built at the heart of the Clifton campus – we've collected opinions on what the future of university libraries will look like.**

# Back to the future: reinventing libraries



## Philip Kent

The University's new  
Director of Libraries



## Why does Bristol need a new library?

It's been a long-term dream of the University to upgrade this library. The Arts and Social Sciences Library is quite old now and if you consider when it was built, a lot has changed: how students study, the resources needed, the technology, their interaction with each other. We are really excited about Bristol's new £80 million library development at the heart of our Clifton campus. Ultimately, students are here to be educated and it's important to invest in quality facilities that inspire innovation and discovery.

My own background is in History, English and Geography, so I'm very conscious that the library is a laboratory for Arts and Social Sciences students. It will function as a community and a collaborative space for students, where they can do self-study but also interact with their peers. It will be a library for the whole University, and provide an opportunity to step up our provision for students. Fundamentally it will support the educational experience, where learning will be extended through exposure to new ideas, space to reflect, and of course books will be front and centre. The new library will also have a gallery space, which will enliven the academic experience and exposure for Arts and Social Sciences students in particular. Students at Bristol have access to incredible academic and cultural materials that many other universities are not able to provide. Gallery space, showcasing and celebrating our University's unique special collections, will help to make the most of them.

## 'It's important to invest in quality facilities that inspire innovation'

We plan to increase cultural collections for display too. We have such rich treasures: a strong feminist collection, a rare book collection, a world-class theatre collection and so many other fascinating manuscripts and archival documents which we really want to showcase. Gallery space will help our collections to become something that the whole Bristol community will be proud of.

One of my aspirations is to advance a fantastic digital experience for students. We'll be introducing a new cataloguing and search system for library items which also links to digital resources. Students will be able to search and access online articles that the University holds subscriptions for. All this will be available via an app on their smartphones.

The library will be inclusive, accessible, inspiring, adaptable and flexible to new ways of learning and technology, and sustainable. It will be built to last and to complement the surrounding heritage. Bristol is one of the world's greatest civic universities: it's always been a leader and beacon of excellence, particularly in research. We all aspire to build on our inspirational teaching and further improve the student experience, and having recently moved from the University of Melbourne to take up my post at Bristol, I'm really looking forward to realising our shared vision for this wonderful new library.

## In numbers

2016-17 academic year  
from the University of  
Bristol libraries

# 2,577,263

Total number of users  
entering libraries

# 3,750

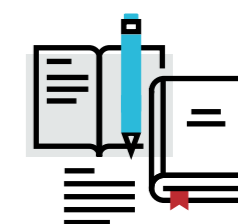
Total number of study spaces

# 306,398

Total number of books lent

# 4,251,221

Total number of full text  
articles downloaded



**Opposite** An artist's impression of a library. Architect designs were presented during the consultation period to appoint a design team. They were included to illustrate candidates' expertise and style. The image is NOT the final design



**'We believe the idea of the library is deeply rooted in our collective consciousness as a place of belonging for everyone'**

**Morten Schmidt**

Schmidt Hammer Lassen Architects in partnership with Hawkins\Brown



**Why is the design of a library so important?**

The library will be at the centre of the University's vision for its Clifton campus to be the welcoming 'heart' to the University – for students, staff and members of the public alike. It will be a space for connection, with ideas and with others.

Digital technologies are linking us more than ever, but we also appear to be more fragmented. Libraries are quintessentially democratic urban gathering places where an increasingly diverse user can connect for their own needs on their own terms. We produce 'democratic architecture' – architecture that focuses on the needs and experiences of the people who use the buildings and spaces we design. A place where diversity is valued. With each project, we observe the social habits, needs and the context of the community where our libraries are built.

Libraries are in constant evolution and being at the forefront of this thinking is essential to doing the best work. We have extensive global experience designing libraries at

Schmidt Hammer Lassen and our work has been honoured with 16 international awards. Designing libraries of the future is unique because of the need to adapt to shifting human behaviour in terms of how we study and gain knowledge. We are developing the way we think about libraries towards what we refer to as 'collection to connection'. How do we design libraries that both collect knowledge and bring people together?

The foundation of our creative approach to designing libraries is the concept of a third space that lies between our homes and workplaces. The urban sociologist Ray Oldenburg says the third space is vital for civil society, democracy, citizen engagement and a sense of place. We agree. We believe that architecture affects lives. We're not interested in building for building's sake – we're interested in making a positive difference.

Libraries make a difference in our lives, in connecting us. With the University's two iconic buildings, HH Wills Physics Building and the Wills Memorial Building, the new library will stand out as the gateway to the campus, a beacon of knowledge, representing the University of Bristol, being visible from all around the Bristol urban skyline.

**Christine Fyfe**

(née Ellis) (BA 1974)



**What does a university library mean to you?**

Inspiration. I came to the University in 1971 when the world was vastly different. I used the Wills Memorial library and can recall the hush of the busy monumental reading room, the hunt for a seat in the many alcoves. The impressive backdrop of the library with its high ceilings and formal wooden furniture was inspiring. We seemed to learn just by being in it. Back then all the resources were printed and we used a card catalogue to locate them. Although individual private study was the main mode of learning, the library was still a social space in the sense that there was an unvoiced fellowship among the hardworking users.

**'Libraries have a unique role in expressing and embodying the mission of the university'**

Although I was the first person in my family to enter higher education, I was no stranger to libraries. I grew up with the public library as a second home, secured a Saturday job shelving books, and worked on the service counter when I was a student. I learned valuable lessons about delivering face-to-face library services. This stood me in good stead throughout my career as the University Librarian and Pro Vice-Chancellor at the University of Leicester including overseeing the £32m library renovation project there in 2008, which went on to win numerous library and architectural awards.

Some years ago, pundits were predicting the end of libraries in the digital age, but there has been more investment in academic library buildings and higher use of those facilities than ever before. Far-sighted institutions are demonstrating that libraries have a unique role in expressing and embodying the mission of the university.

It's thrilling that Bristol sees the library as the hub of the Clifton campus and significant investment has been earmarked to support this conviction. It's good to hear that extensive consultation on the detailed plans is to take place too – the most important and stimulating part of the project if the library is to become truly the heart of the University. The vision of libraries, evident when I was at Bristol, endures in the digital age: an inspiring environment to support learning and the creation of knowledge.

**Eloise Kane**

Part-time distance-learning student



**What will a library in the future be like to use?**

Since I was six years old, I've been fascinated by the past. I went on weekly excursions to the library and read everything from Ancient Egypt to the entire Nancy Drew series. I was determined to be an archaeologist and thanks to AHRC funding I'm now doing a PhD in historical archaeology.

But so much has changed since I was six. As a mother and part-time distant-learning student there are so many challenges to overcome. My hours are bound to childcare, which in rural Wiltshire is pretty restrictive moneywise and timewise. I need to incorporate archive visits, fieldwork, and teaching, and last semester required military organisation of grandparents, friends, afterschool clubs, and transport. I'm grateful that the library can post me books when I need them, but now we have the internet, lots of things are available online too.

To study the past I've had to dig even deeper into the future. I love the countryside, but it has a huge transport problem, which makes travelling into Bristol incredibly inefficient and impossible if you're on a tight timescale. Technology has been essential in enabling me to pursue my passion without sacrificing time with my children. But it still has a long way to go.

My dream library would exist in two places: virtually and physically. The resources I need would be online, such as datasets and historical documents. The University has a wonderful stock of hidden knowledge held in documents and collections it's built up over many years, and it would be great to access these more easily. Academia is also increasingly called upon to engage with the public, which can be difficult to find space for. A public-facing exhibition space is a perfect way to give postgraduates an opportunity to be involved in communicating our work. Finally, my pie-in-the-sky dream would be an ad-hoc crèche.

My eldest daughter is now six years old, and we've enjoyed exploring books on topics like outer space and the Great Fire of London. By the time she goes to University I want to see increased inclusivity and accessibility in the digital and real world, so that everyone can benefit from the knowledge held and generated in these amazing places. ●



**Specialist researchers at Bristol are investigating the security of systems and the inputs required from human users.**

# Cybersecurity

## Humankind vs machine

Most people, when asked what cybersecurity is, would answer by saying that it's making sure we stay safe online, by using strong passwords and up-to-date software. But human behaviour also has a large part to play.

Awais Rashid, Professor of Cybersecurity, is researching both critical aspects. His work investigates the security of that which we might consider to be obvious: computers, mobile phones, Internet of Things devices, as well as systems that are embedded in our critical infrastructure such as water treatment plants and power grids. To understand how people might add value, he also looks at the human component of cybersecurity – how attackers attack our systems, how we detect such attacks, and how we respond to attacks.

One of the things he's analysed is how people make decisions around security. Because a lot of these decisions are about critical infrastructures there is a lot of confidentiality around them, making it difficult to get the information required.

He and his team devised a game which allows people to discuss how they make security decisions in a general context, without referring to their organisation. The game is effectively a set of building blocks and it represents a utility infrastructure. A lot of the gaming around cybersecurity is about attacking systems and learning from attacks, but Professor Rashid asks people to play the role of defenders, and to collectively make decisions around how to deal with the attacks.

**'If your employees are falling victim to social engineering through email, then your network remains vulnerable to attack.'**

Right Researchers at Bristol want to develop a better understanding of the human variable in cybersecurity



Some interesting decision patterns became apparent. Good patterns included attempts to balance between security priorities, open-mindedness and adapting strategies based on inputs that challenged one's pre-conceptions. Bad practices included tunnel vision, that is, disregarding information given by the environment that did not fit one's self-proclaimed 'security expertise' and focusing excessively on expensive technological solutions while neglecting basic security hygiene. 'In some cases, you can have a very high-tech network monitoring device, but if your employees are falling victim to social engineering through email, then your network remains vulnerable to attack,' Professor Rashid says.

#### The human element

Professor Rashid is not alone in wanting to develop a better understanding of the human variable in cybersecurity. Dr Emma Williams, who has a background in psychology, a doctorate in deception, and a career that has included time spent working in both the public and private sector, is interested in what makes us engage in secure behaviour online. Dr Williams is conducting her research in her position in one of the newly created Vice-Chancellor's Fellowships.

'My research looks at how we can ensure that users are engaging in secure behaviour online,' she says. 'And understanding that means answering a range of questions, such as: are we more susceptible to so-called phishing scams at certain points in time? And can our devices adapt to these potential vulnerabilities? For example, if your device can detect that you're busy or distracted, can it send a request to update important software at another, more appropriate, time?' By looking at the ways in which people make decisions with regard to their own online security, Dr Williams aims to answer some of these questions.

One key issue is the simple idea that security must not be burdensome. Professor Rashid believes it is security experts who must lower the burden on the user. 'We can't have people changing passwords every few days, we can't expect people to remember 30 passwords. Security is seen

#### In numbers

**46%**

Percentage of UK businesses that had at least one cybersecurity breach in 2017

**£4.5 trillion**

The predicted global annual cost of cybercrime by 2021

**39 seconds**

The average rate of hacker attacks of computers with internet access



as a barrier, and as researchers we have to make it more seamless. We are looking at how the design of security systems acts as a barrier to usability and what can we do to empower users.'

#### The mathematics

Bristol's School of Mathematics will be offering a new MSc in Mathematics of Cybersecurity in autumn 2018. Oliver Johnson, Professor of Information Theory, says, 'Historically people think cybersecurity sits in the realm of Computer Science – that all you need to do is create an algorithm and everyone is secure. But a lot of these algorithms are based on mathematical ideas. Bristol's MSc programme will be unique in the UK because it is hosted in the School of Mathematics. Cybersecurity is a key area of emerging importance. With an Academic Centre of Excellence in Cybersecurity in Bristol, and our refurbished and expanded Fry Building giving us a lot more space for Mathematics, we have the platform for new, forward-looking courses.'

The new MSc will offer students the opportunity to prepare for future threats to encryption, such as quantum computers. Professor Johnson explains: 'Encryption on the internet relies on the idea that factoring big numbers is hard. It's known that quantum computers can do this efficiently, once somebody builds one. We're not there yet, but when planning ahead, maybe the algorithms in use now aren't secure long enough into the future. So, by including quantum computing on this course, students will be able to consider what the next generation algorithms could be.'

Professor Johnson goes on to add: 'I don't think it's going to be a case of a quantum computer on every desk, but for certain high-level transactions, we need to have these quantum-secure protocols built in. But that's part of the excitement, looking to the future.'

And it makes Bristol an exciting place to be, particularly with regard to the new Temple Quarter Campus and the Quantum Technologies Innovation Centre that will be hosted there, with cybersecurity one of the topics that has been identified for the new campus.

Cover and main image © Dave Pratt // Laptop users © rawpixel.com on Unsplash



Above With the prevalence of online activities in society today, cybersecurity is of paramount importance

'I think it's clear that a lot of the exciting applications, driverless cars, 5G phones, healthcare, will be generating vast amounts of data and it's going to be absolutely imperative to ensure that data is protected. It's a huge challenge, and it's also one of the exciting things about Temple Quarter: we'll be looking at big problems that require a commonality between thinking and approaches,' says Professor Johnson.

Alongside the benefits of collaboration between industry, government, and the University, is the opportunity to have an arena where not only technologists will look at cybersecurity. The new campus will have social scientists working alongside legal experts and ethicists, for example developing thinking around questions such as: if someone is hit by a driverless car, who's responsible? The passenger, the person who wrote the code, the person who sold the car?

Though they may not conform to our preconceived notions around cybersecurity, these questions are becoming increasingly important. 'It may have been in the past people thought of cybersecurity as the computer on their desk, but as the Internet of Things takes over it's your fridge talking to your smart home hub,' Professor Johnson says. 'There's a growing network of connected devices, so whereas in the past people may have thought 'I can opt out of the internet', now the internet is so ubiquitous, that's not possible. Protecting that information is a huge challenge.'

And how is Bristol helping to keep all that information safe and secure? We're working to better understand human behaviours around security, and decision-making processes. We're developing new cryptography techniques, and working on stronger software engineering. We're studying vulnerabilities across human and technological platforms. What's more, the University has huge strengths in mathematics, computer science, cryptography, and engineering. And with our new MSc we're making sure that the next generation has the skills to tackle the security risks we have yet to imagine. ●

**Alumnus Dr Tom Carter (PhD 2017), CTO and co-founder of technology firm Ultrahaptics, tells us about touching things that aren't there.**

# Virtual touch

Imagine if you could reach out with your hand and touch a shape in mid-air – a virtual object that you could feel, but not see. That might sound like science fiction, but it's real, and it's happening here in Bristol. Ultrahaptics' technology, which is based on my PhD, uses ultrasound to create three-dimensional shapes and textures in mid-air.

I've always been passionate about interface design, the user experience, and making things better. Human interaction with things should be efficient and easy for the user. I'm sure I'm not the only who gets annoyed by parking machines with impossible instructions, or the way when you need to change radio station in your car you have to flail around for the button while trying to keep your eyes on the road.

That's what our technology is all about – making the way we interact with machines easier and more intuitive. As our tech develops I'm excited about its possible use in so many areas. For now, though, Ultrahaptics has featured in trials of an interactive movie poster and was also part of an art installation at Tate Britain. We've seen our tech rolled out into gaming machines and featured as part of a Halloween show at The Magic Castle in Hollywood.

Founding my own company has always been something I've wanted to do. When I was studying Computer Science at Bristol I was lucky to be in a department that was so forward thinking. I was able to take modules in things such as entrepreneurship, learning about business plans and how to raise investment capital.

The people I met and worked with at Bristol stretched and encouraged me beyond traditional departmental boundaries. Ultrahaptics also benefited from being part of the University's SET Squared incubator, currently housed in the Engine Shed hub where Brunel used to work.

It's great to see entrepreneurship become more firmly embedded in the University curriculum, particularly with the new Temple Quarter campus that will have innovation at its heart. I believe you can start a business from any background and it's so encouraging to see this new way of studying come to life. ●

'Bristol is my favourite place. There's an incredible mixture of both creative and tech industries, and there's a great energy about the city'





**Nonesuch** takes a look at what the city and the University are contributing to the world of cinema and television in the digital age.

# Bristol's pursuit of film excellence



When you think of Bristol and the world of small and big screen, what springs to mind? Hollywood star and Horfield native Cary Grant? Aardman Animations' *Wallace and Gromit*? What about the BBC's *Blue Planet* and David Attenborough? Or maybe you just fondly remember curling up in front of the latest offering from the University's Film Society during your time here.

Our alumni in the world of film and television include actors, directors, writers and special effects experts. They've won Oscars and BAFTAs and are seen as leaders in their fields. Even our University buildings have had a starring role. The 1990 BAFTA-award-winning film *Truly Madly Deeply* was filmed on location at our very own Goldney Hall, while 2006 hit *Starter for Ten* was filmed at the School of Chemistry.

Bristol's reputation as a city of film continues to spread far and wide, and in late 2017 Bristol was designated UNESCO City of Film, becoming an official member of the international UNESCO Creative Cities Network. Dr Angela Piccini, from the School of Arts, said: 'UNESCO City of Film status draws together all of the diverse film, television, and screen media activities across the city. Here at the University we actually teach and research across moving image forms in many Faculties, far beyond the Department of Film and Television and Faculty of Arts – from medical imaging, to computationally driven innovation, to the politics and power of media representation and the aesthetics of industry-facing practices. Bristol is at the forefront of moving image innovation and the creative industries.'

And in February this year our Chancellor Sir Paul Nurse FRS FMedSci conferred an Honorary Doctor of Letters upon Col Needham – who some have referred to as the 'most powerful Brit in Hollywood' – for his contribution to the film industry. Dr Piccini gave the oration for Mr Needham, who is the founder and CEO of the renowned website IMDb (Internet Movie Database). Formed in 1990 IMDb became a wholly owned subsidiary of Amazon.com in 1998. As a film buff Col wanted to build a portal of information on all things screen-related, where like-minded individuals could connect and share their love of film no matter where they were in the world. Today IMDb has over 250 million monthly visitors, who go online to rate, review and read everything they can about films and TV shows from around the globe. Col talks about how Bristol has been so important in the success of the company, and why it still has its heart in the city: 'We manage the world's largest database of film and television information from Bristol. It's a 250 million item database based in the city, and I don't think the company would have grown the way it did had I been anywhere else. Bristol has been a city of technology companies and media entities for a long time. With IMDb sitting at this intersection of film and technology, when we need to hire we can find people with the right skills.'

As the University continues to grow and integrate its focus on technology and innovation, we look forward to continuing to enjoy Bristol's status as a place for film to flourish. ●

Opposite Col Needham from IMDb surrounded by some iconic film-related images of Bristol

**Biologist Sara Correia Carreira plans to build robotic skin, conducting research into the combination of robotics with bioengineering – just one of the ground-breaking projects being investigated by the first cohort of Vice-Chancellor’s Fellows. These Fellowships highlight the spirit of innovation and collaboration that is taking us into the future.**

## Futuristic healthcare

As a child I remember being fascinated by the robotic hand of Luke Skywalker in *Star Wars: The Empire Strikes Back*, and what he could do with it. Interfacing living tissues with non-living replacement parts seemed a tremendously exciting idea! But I never thought that today, as a biologist, I would get to work with an amazing robotics team in the realm of healthcare. I never imagined that human biology could work so closely with an area of engineering as complex and interesting as robotics.

As part of my research programme I am working on a way to engineer a living and moving robotic skin. Skin is something I became interested in very recently, while working on antimicrobial sprays and creams that can be topically applied to prevent infection of wounds. Through my work I discovered that it was impossible to test how well these creams and sprays would perform on the skin of an actual living, moving human – for example, would they slide off as the skin moves around? Would they penetrate properly as the body went through its natural motions? We cannot know, as there is simply no laboratory model of moving skin – the current models are flat and static, with skin grown as a sheet on a rigid plastic membrane.

My research aims to find a way to apply those mechanical stresses to engineered skin. Apart from making it a far more realistic model of skin, it could also improve the mechanical properties of the bioengineered tissue, so that it more closely matches the characteristics of real skin.

How am I going to make this work? Robotic skin! I plan to replace the rigid membrane with something stretchy, using soft robotics, to mimic the muscles that would be underneath real skin. The ability to bioengineer the skin exists and Bristol is making incredible progress with soft robotics. I will be collaborating with colleagues to create both. Then the biggest challenge of all will be finding a way of attaching the skin to the robotics underneath, which is what has never been done before.

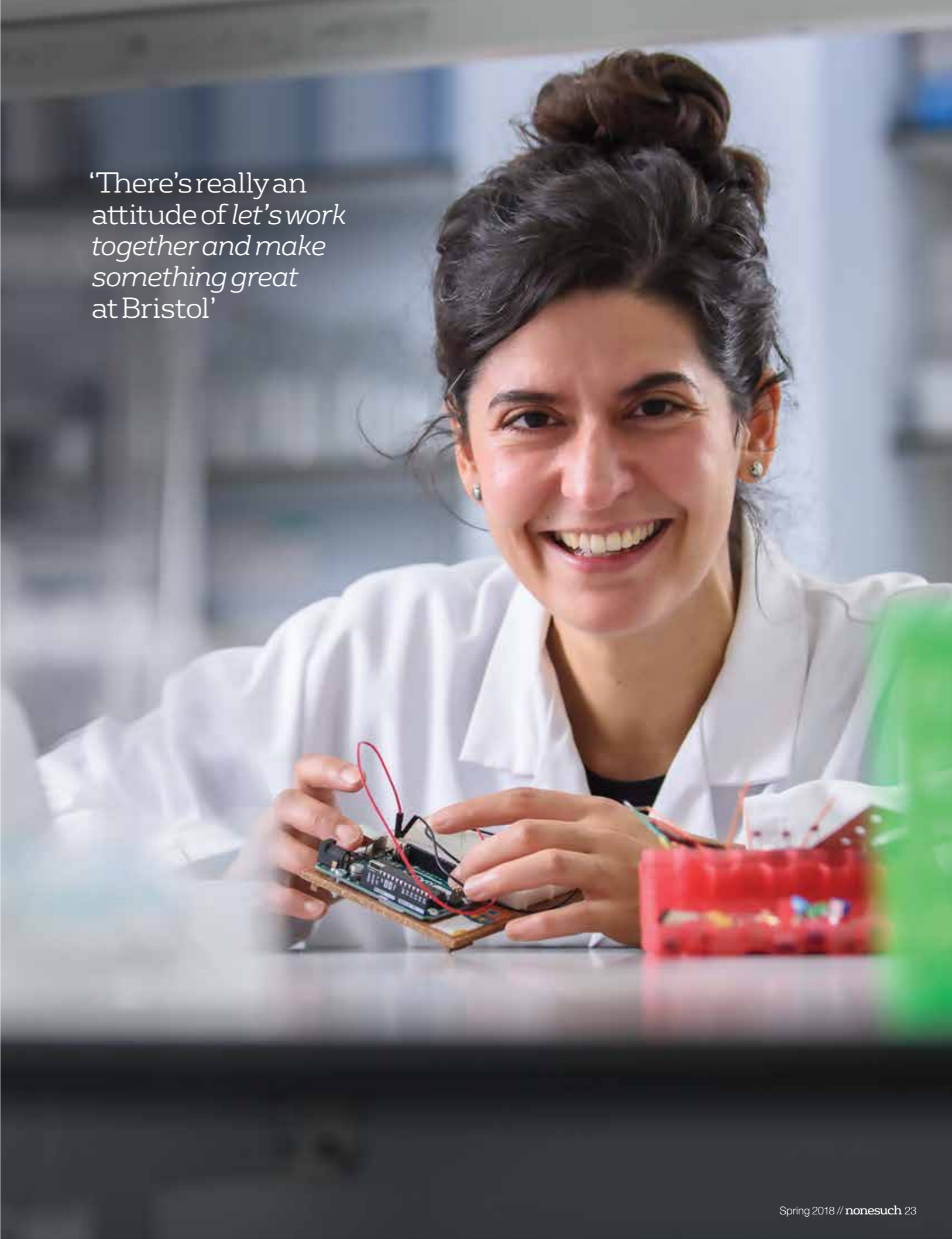
Initially the robotic skin will be used to investigate whether the movement of medication across this model is different from the current static models. But it could improve people’s lives in other ways, for example burns patients who need skin grafts. With robotic skin we could test it under more life-like conditions, making it less likely to rupture when grafted onto the patient.

To even attempt what I want to do I needed certain conditions in place – which Bristol readily fulfils. This project requires: an institution with a reputation for research excellence; world-renowned robotics and bioengineering facilities; and a willingness across faculties to work in an interdisciplinary and collaborative way. I will be working with some incredible colleagues here in different departments to make this project a reality.

When the call for applications to the new Vice-Chancellor’s Fellowships went out, I jumped at the chance to apply. My experience at Bristol doing both my PhD and my postdoctoral research had demonstrated very clearly what a unique collaborative experience could be had at this University. I did my first degree in Biology in Germany, where I’m from, and afterwards I was unsure if I wanted to continue with academia. My time at Bristol has shown me what wonderful opportunities are being afforded here, to researchers like myself who are excited about the advancements we can make for humanity. The research that I and other scientists are working on right now is uncharted territory. I’m grateful that Bristol is giving me the opportunity to do this research and make a real-world impact on healthcare. ●

**The University’s first cohort of 12 Vice-Chancellor’s Fellows started in the academic year 2017-18 with one Fellow fully supported by philanthropy. Alumni funding for a further four Fellows for 2018-19 has been secured, to bolster the cohort of 14 funded by the University. For more information about the Fellows see [bristol.ac.uk/vc-fellows](http://bristol.ac.uk/vc-fellows).**

‘There’s really an attitude of *let’s work together and make something great* at Bristol’



**Erik Lithander, Pro Vice-Chancellor (International),** tells *Nonesuch* what our global alumni network means to Bristol.

# Our global alumni network



**Dr Erik Lithander**

Pro Vice-Chancellor,  
University of Bristol

For a university like Bristol, alumni are an essential part of our community. The wise counsel and energetic support of all our alumni plays a crucial role in our ambitions for Bristol. Bristol has built a reputation for excellence over more than 140 years and this excellence is reflected in the success of the alumni who have passed through its doors.

One of Bristol's many alumni influencers is Goh Siu Lin – featured opposite – whose contribution to the law sector in Malaysia is an inspiration. Our alumni make major contributions in the corporate world, public sector, charities, community organisations, government agencies and start-up companies all around the world.

We are immensely proud of our alumni, and it's wonderful to see so many stay in touch with Bristol – those who act as volunteers, as mentors, and those who run and support local groups worldwide. An ongoing partnership with our alumni is one of the most important tools for our future collective success.

*'University of Bristol alumni are inspirational leaders, advocates and influencers in every corner of the globe'*



## Beyond the Clifton campus

From Bristol to Beijing, Sydney to Seattle, alumni volunteer to keep your University network alive. Did you know that you can access these networks to make social as well as professional connections? You can get involved with location-based groups and special interest groups as well as attending events in the UK and overseas. Make sure you keep your details up to date and watch out for events and meetings near you. For more information on how to join in, go to [bristol.ac.uk/alumni/networks](http://bristol.ac.uk/alumni/networks).



## Spotlight on...

**Goh Siu Lin (LLB 1993), Malaysia**

I chose to study at Bristol for many reasons. It is well known for having one of the top Law faculties in the UK. I was drawn to the vibrancy of the student community and loved the iconic grandeur of the Wills Memorial Building. When I graduated I was the first lawyer in my family. While at Bristol I took up volunteering opportunities with Bristol's Student Community Action and did ballroom dancing which enriched my student life. I also made friends of all nationalities and backgrounds – I love food and there were never too many dinner parties at Bristol, all with new and exciting flavours!

The key things that Bristol gave me were an excellent legal education in a supportive and enriching learning environment, a place for self-discovery, and many, many lifelong friendships. Upon my return to Malaysia I gained admission to the Malaysian Bar and practised for the next two decades at Messrs Shook Lin & Bok. Then when I became the first female to win the Chairman post on the Kuala Lumpur Bar Committee, I was exhilarated! It was as if I'd crossed the finishing line for a marathon.

I'm passionate about women's and children's rights and have written and advocated for more gender-responsive laws, policies and systems. My proudest achievement to date was being part of the intense lobbying and legislative efforts which crystallised in the passing of the Sexual Offences Against Children Act in Malaysia on 26 April 2017. If I had any advice for my younger self it would be to read more, to be more involved in Bar activities and to develop networks. I've now set up a small boutique law practice of Messrs Kee Sern, Siu & Huey and this, together with my responsibilities for the Kuala Lumpur Bar, keeps me on my toes!

*'Bristol is a place for excellent learning and lifelong friendships'*



## Calendar May 2018 to December 2018

Make sure you're invited to relevant events in your area by updating your details at [bristol.ac.uk/alumni/mydetails](http://bristol.ac.uk/alumni/mydetails)

### MAY

Sunday 6 May  
**Annual golf challenge** // Bristol

Tuesday 15 May  
**London Branch walk** // London

Wednesday 23 May  
**Charter Day (invitation only)**  
// Bristol

Tuesday 22 May  
**Perth Alumni 'get-together'**  
// Perth

Tuesday 29 May  
**Sydney Alumni 'get-together'**  
// Sydney

### JUNE

Friday 8 June  
**2nd Jeremy Morse lecture (IGRCT)** // Bristol

Thursday 21 June  
**Bristol Law School Alumni Dinner** // London

### JULY

Saturday 14 July  
**Alumni Reunion Weekend 2018**  
// Bristol

Come back to Bristol and rediscover your University with friends old and new. Why not organise a group of friends to share a table at the celebration lunch in the Great Hall of the Wills Memorial Building? A weekend programme of events is being held – for details please visit the web page [bristol.ac.uk/alumni](http://bristol.ac.uk/alumni).

Right Recipients of Alumni Association Student Awards 2017

### SEPTEMBER

Friday 28 September to Sunday 30 September  
**Eastern Canada reunion**  
// Ontario

### OCTOBER

Saturday 6 October  
**Benefactors' Reception (invitation only)** // Bristol

Saturday 20 October  
**Cambridge Branch annual dinner** // Cambridge

Thursday 18 October  
**Wills Hall Association annual reception** // London

### NOVEMBER

Saturday 17 November  
**Officer Training Corps annual dinner** // Bristol

### DECEMBER

Thursday 6 December  
**Alumni Association Student Awards and reception** // Bristol

Monday 10 December  
**London Branch carol service**  
// London



**Julie Goldstein (BSc 1978)**  
**Chair of Convocation and the Alumni Association**

The last six months have been a period of deep reflection and dedicated focus on future opportunities to refresh and re-energise our alumni association.

I am delighted to report on the success of signature events that have taken place over recent months. Events such as the Alumni Association Student Awards and Reception in December 2017, with over 180 in attendance to celebrate the achievements of our outstanding students and to congratulate Dr Martin Crossley Evans MBE on the award of a Certificate of Recognition for his long-standing support of the University. This event took place in the Anson Rooms and was organised in collaboration with the Bristol SU. In February 2018 we once again welcomed our former Chancellor, The Rt Hon, The Baroness Hale of Richmond DBE, who gave an insightful and engaging talk to an audience of over 500 alumni, students and staff at the Alumni Association Annual Lecture.

I would like to advise alumni that, to further our aim of providing vibrant and active alumni engagement with the University, Court approved changes to Convocation in December 2017 including the official change of name from 'Convocation' to 'the Alumni Association' and modifying the membership to focus on graduates of the University and Associate Members.

I would like to express my warmest thanks to all our volunteers around the world who have contributed their time, expertise and resources in so many ways by organising events and working with the Development and Alumni Relations Office to help build an engaged alumni community.

# Bristol is powered by people like you

Your achievements inspire us. Your advice encourages us. Your donations drive us forward.



As a 19-year-old woman, at the front of a young woman, at the front of authority and explaining her passion. I'm pursuing my PhD each year I'm determined to be supported and looked-out-for

Natalie Jester (BSc 2011)

## Thank you

From everyone at Bristol, thank you for your continued support, in all its forms. Thank you for believing in us, championing our cause, introducing us into conversations, proudly talking about us, giving time and generously making donations.

Everything you contribute helps the best and brightest come to Bristol, keeping us at the forefront of innovation and expertise.

Your gifts ensure our students make the most of everything Bristol has to offer, whatever their background.

To find out how you can do more to power Bristol and its people, go to: [bristol.ac.uk/alumni/give-back](http://bristol.ac.uk/alumni/give-back)

For more information and details of how to book, please visit [bristol.ac.uk/alumni/events](http://bristol.ac.uk/alumni/events) or call +44 (0)117 394 1049

# Alumni in memoriam

The University extends its sincere condolences to the friends and families of those listed below for whom we have received notification of death.

**Lawrence Curtis** (BSc 1940) died July 2017, aged 97

**Derrick Hughes** (BSc 1940) died December 2017, aged 98

**Eileen Lewis (née King)** (BA 1940, Diploma 1941) died September 2017

**Kenneth Stark** (BSc 1947) died February 2017, aged 89

**Christine Long (née Morrill)** (BA 1948) died January 2017, aged 90

**Emeritus Prof David Berry** (LDS 1949, BDS 1950, MDS 1952, PhD 1959) died October 2017, aged 96

**Rev Canon Richard Craston** (BA 1949) died January 2018, aged 95

**Dr June Morgan** (MBChB 1949) died December 2017, aged 92

**Marjorie Avery (née Smith)** (BA 1950, Diploma 1951) died 2017, aged 88

**Keith Bowey** (BSc 1951, Cert Ed 1954) died October 2017, aged 87

**Dr Jean Margaret Claremont (née Den Ottolander)** (MBChB 1952) died 2017, aged 88

**Monica Coldrey (née Sim)** (BA 1952, Cert Ed 1953) died 2017, aged 87

**John Dennis** (BA 1952, MSc 1963) died December 2016, aged 90

**Anthony Edwards** (BA 1952) died 2017, aged 88

**Donald Jones** (BA 1952, MLitt 1972) died September 2017, aged 87

**David Mizen** (BSc 1952) died September 2017, aged 87

**William Paton** (BA 1952) died 2017, aged 89

**Mary Roberts (née Seddon)** (LLB 1953, LLB 1988) died September 2016, aged 83

**Barry Williams** (BA 1953, Cert Ed 1957) died October 2017, aged 85

**Maureen Wright** (BA 1953) died April 2017, aged 86

**Peter Beams** (BSc 1954) died November 2017, aged 91

**Janet Dean (née Smith)** (BA 1954, Cert Ed 1955) died June 2017, aged 84

**Dr Mary Cantwell (née Jorro)** (MBChB 1955) died July 2017, aged 85

**Alan Hazell** (BSc 1955) died December 2017, aged 82

**Derek Stoaling** (BSc 1955) died October 2017, aged 82

**The Rev Noel Warman** (BA 1955) died November 2015, aged 88

**John Boutflower** (BVSc 1956) died December 2017, aged 84

**Anne Cottam (née Wright)** (BA 1956) died December 2017, aged 83

**Brian Tarring** (LLB 1956) died 2017, aged 82

**Michael Webber** (BA 1956, Cert Ed 1959) died September 2017, aged 83

**Mark Wynn** (BSc 1985) died February 2018, aged 54

**Stephen Whiteside** (BSc 1956) died 2017, aged 82

**Michael Seel** (BSc 1957) died 2017, aged 82

**Colin Simpson** (LLB 1957) died February 2017, aged 88

**Dr Michael Wong Pakshong** (BA 1957, Hon LLD 1994) died 2017, aged 86

**Peter Browne** (BSc 1958) died October 2017, aged 81

**Dr Richard Chapman** (BVSc 1958) died May 2017, aged 81

**Thomas Hyland** (BDS 1958) died April 2017, aged 82

**George Maybury** (BA 1958) died May 2016, aged 81

**Adrian Morrey** (LDS 1951-1958) died 25 November 2017, aged 84

**David Searle** (BA 1958) died August 2017, aged 80

**Margaret Banning (née Greenland)** (BA 1959) died January 2018

**Patricia Edey (née Best)** (Testamur 1959) died December 2017, aged 83

**Janice Woodfield (née Tinley)** (BSc 1959) died 2017, aged 79

**Carole Betts (née Leggett)** (BSc 1961) died September 2017

**Timothy Brodrick** (BVSc 1961) died November 2017, aged 78

**Elizabeth Grugeon (née Allsopp)** (BA 1961) died October 2017, aged 77

**Anne Smyth (née Lander)** (BA 1961) died December 2017, aged 78

**Andrew Wall** (BA 1961, MSc 1981) died October 2017, aged 81

**Graham Barney** (BSc 1962) died May 2016, aged 76

**Prof Leslie Hough** (DSc 1962) died 2017, aged 92

**Emeritus Prof Roger Parsons** (DSc 1962) died 2016, aged 90

**Joan Pick** (BSc 1962) died January 2017, aged 76

**Norman Brayshaw** (BA 1963) died January 2018, aged 76

**Laurence Wheeler** (BA 1963) died 2017, aged 76

**Gillian Burton (née Sanders)** (BA 1964) died September 2017

**Gareth Gunning** (BA 1964) died July 2017, aged 76

**Dr Ann Noble (née Peerless)** (BArch 1964, Diploma 1966, PhD 1988) died December 2016, aged 74

**Prof Rodney Taylor** (BSc 1965) died May 2017, aged 74

**Prof Nigel Trewin** (BSc 1965) died October 2017, aged 73

**Dr Richard Swigg** (PhD 1966) died 2017, aged 79

**Grenville Hatton** (BSc 1967) died July 2017, aged 72

**Christopher Carkeek** (BA 1969) died 2017, aged 70

**John Gay** (BA 1969, Cert Ed 1970) died May 2017, aged 70

**Carole Rowe (née Coverley)** (BA 1969) died 2017, aged 70

**Stephanie Holt (née Watson)** (BSc 1970) died January 2017, aged 68

**Dr Janet Smith** (PhD 1970, Continuing Education 1989) died 2017, aged 72

**Dr Nicholas Pickvance** (MBChB 1972) died January 2017, aged 68

**Petronella Armitage-Smith** (BA 1973, Diploma 1984) died December 2017, aged 66

**George Bartlett** (BEd 1974) died September 2017, aged 83

**Dr Ian Prescott** (MBChB 1974) died September 2017, aged 66

**Barry Jacobs** (BEd 1975, MEd 1985) died 2017, aged 82

**The Rev Michael Hucker** (MA 1976) died August 2017, aged 84

**Paul Phillips** (LLB 1977) died November 2017, aged 62

**Richard Parsons** (BSc 1981) died April 2017, aged 57

**Karen Yorke (née Wilbourn)** (LLB 1981) died October 2017, aged 58

**Ian White** (MSc 1982) died October 2017, aged 70

**David Ettle** (BSc 1984) died December 2017, aged 55

**Edward Killick** (BSc 1996) died 2018, aged 45

**Dr Olivia Alderson (née Millington)** (BDS 1997) died July 2016, aged 43

**James Bambury** (BSc 1997) died September 2017, aged 41

**Abdul Bin Mohd Tahir** (MEd 1998) died May 2017, aged 59

**John Birtwistle** (EdD 2000) died 2017, aged 72

**Emma Kelty (née Wrangham)** (MSc 2003) died September 2017, aged 43

**Penelope Johnstone** (MA 2004) died February 2017, aged 76

**John Godwin** (MA 2014, PhD 2017) died August 2017, aged 75

**Petra Armitage-Smith**, former Assistant Registrar, died December 2017, aged 66

**Philip Pettit**, former Dean of the Faculty of Law and Pro-Vice Chancellor, died November, aged 92

**Gillian Attryde**, benefactor to the University, died January 2017

**David Berry**, Emeritus Professor of Dental Surgery, died November 2017

**Kenneth Mobbs**, former staff member, died October 2017, aged 92

**John Burrow**, Emeritus Professor and former Dean of the Faculty of Arts, died October 2017, aged 85

**Peter Skrine**, former Professor of German at Bristol, died May 2017, aged 82

**Elisabeth Lazarus**, Former Senior Lecturer in Education and Modern Languages, died 2017, aged 61

Please email any notifications for alumni in memoriam to [alumni@bristol.ac.uk](mailto:alumni@bristol.ac.uk)

# Future communications – don't miss out

**Do we have your current and correct email address? If we don't, you could be missing out.**

- Your alumni reunions and networking event invitations are sent via email
- News and opportunities for professional connections are contained in our e-newsletter
- Nonesuch is going digital soon as part of our sustainability drive
- A new online portal for alumni across the globe will be launching in 2018

Make sure you update us at:  
**[bristol.ac.uk/alumni/mydetails](http://bristol.ac.uk/alumni/mydetails)**  
 or via the 'Keep in touch' details below.

## Keep in touch

Telephone **+44 (0)117 394 1046**  
 Email **[alumni@bristol.ac.uk](mailto:alumni@bristol.ac.uk)**  
 Website **[bristol.ac.uk/alumni](http://bristol.ac.uk/alumni)**



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## nonesuch

Spring 2018

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**Design**  
[pelotondesign.co.uk](http://pelotondesign.co.uk)

**Produced by**  
 Development and Alumni Relations Office  
 Senate House  
 Tyndall Avenue  
 Bristol BS8 1TH

**Printed by**  
 MPS Marketing Services Ltd and Precision Colour Printing

*Nonesuch*, Spring 2018  
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If you need part or all of this publication in an alternative format, please telephone +44 (0)117 394 1046.

Nonesuch magazine // Spring 2018  
 Printed on Royal Roto Silk  
 FSC® 130gsm





# Everyone can leave a legacy

Bristol left such a profound mark on **Veronica Macmillan** (BSc 1945) that she gifted a large legacy to her old school, Physics. This gift will support the school where researchers such as **Astrid Blee** continue to embody the spirit of diversity and exploration that have always been the cornerstones of Bristol.

'I love studying for my PhD at Bristol, there's a very strong sense of community. Bristol is great at nurturing talent and has a strong vision for what Physics will look like in the future.'

**If you'd like to join people like Veronica please contact us to find out more.**

**Jenny McGee** Planned Giving Officer  
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Photo of Veronica Macmillan courtesy of University of Bristol Special Collections

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