

**Research, Innovation  
and Enterprise:**  
Shaping the future  
**2023-2024**

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# Research, Innovation and Enterprise

Hello and welcome to the second edition of Research, Innovation and Enterprise: Shaping the Future, showcasing more of our colleagues' work and research.

The post-Covid world of 2023 has certainly been brighter than previous years, with campus becoming a bustling hub of work and study once more, but it has not been without its own challenges. The cost-of-living crisis, geopolitical instability and the climate crises mean that the need for impactful research and innovation has never been more pronounced.

The articles in this edition show how our research and innovation are underpinned by our commitment to improve lives, engage with people and organisations and work together with them to shape a better future.

For example, the research to help children with movement and handwriting difficulties shows how our work can improve these children's lives by helping them to overcome their challenges and build their confidence. The Edible Streets project fosters interest in science and, while encouraging affordable healthy eating, it also promotes community cohesion and wellbeing.

Our research also informs public and community engagement activities like the Think Human Festival, which promotes collaborations between our staff and students, community groups and third sector organisations. It also encourages debate and reflection on topical issues explored

through the lenses of humanities and social science disciplines. We collaborate with industry, as illustrated by the work of the Joining Technology Research Centre within the School of Engineering, Computing and Mathematics to help mass produce the next generation of more efficient, reliable and powerful electric vehicles.

Our Enterprise Centre, established in collaboration with OxLEP and formally launched in September 2022, provides a space for startups and spinouts to grow and contribute to the UK economy. We ensure that our students benefit from the presence of these companies on campus, as they provide opportunities for internships and employment as well as inspiration to become entrepreneurs.

None of this would be possible without nurturing the talent of the next generation of researchers, professionals and entrepreneurs. We conclude this edition with a series of profiles that include a graduate from the Oxford Brookes Business School who, with the help of our colleagues, has set up his own startup, and three of our doctoral students sharing their research projects and future aspirations.

I hope you enjoy reading about what we do.



**PROFESSOR LINDA KING**  
Pro Vice-Chancellor,  
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# Impact of Research



## Fighting Hate Crime Through Legal Reform

**2023 marked the 30th anniversary of Stephen Lawrence's tragic murder, and since that day the fight against 'hate' in British society has lost none of its relevance. Incremental changes in UK law since then, rather than keeping the issue relevant, have created inconsistencies and a lack of grounding in sound legal principles. The work of Reader in Law Dr Chara Bakalis, however, has made a powerful contribution to the fight against hate crime.**

Chara's work has not only helped to keep victims better protected, but also given legislators and policymakers across the UK a better understanding of hate crime, which has translated into reform proposals of hate crime laws. This has also involved the updating and revisiting of legislation for the increasingly online modern world – something that was never anticipated or accounted for when many of these laws were created.

Particular areas of Chara's focus include the delineation of online and offline hate crime, how hate grows and is fuelled by social media, and a shift of focus in legislation from conduct to harm, by changing outdated terms and phrases, to remove potential for conflict with other laws that protect freedom of expression. Chara also argues for a clearer and more principled definition of hate crime, linked to the protected characteristics set out in the Equality Act 2010. Her definition seeks to build a wider understanding of the harm caused by online hate, putting forward a framework for identifying the 'bystanders' who are also harmed by it despite not being the direct targets.

Chara's findings were used by the Law Commission as the basis for reviewing the Communications Act 2003 and the Malicious Communications Act 1988 governing hate speech. Their report to the Ministry of Justice, following her recommendations, examined how online communications should be reformed to protect people from harmful online behaviour. The Commission consequently recommended that existing hate crime provisions in England and Wales be replaced with a single offence of causing emotional and psychological harm. By focusing on the harm caused, rather than the perceived 'offensiveness' of hateful content, minority targets can be protected, with general freedom of expression maintained. Chara has also produced a report for the Armenian Ministry of Justice with recommendations for reforming Armenian hate speech laws, as well as providing recommendations for Judge Desmond Marrinan's independent review of Northern Irish hate crime legislation in 2020. She has undertaken several projects for the Council of Europe, including the creation of a handbook on legislating for hate speech which has been shared with hundreds of Parliamentarians across Council of Europe Member States.

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**DR CHARA BAKALIS**  
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## Help with Movement and Handwriting Difficulties

Children and young people with movement difficulties face serious challenges in education and everyday life. Better assessment of these difficulties is key to unlocking their potential and raising their confidence. A set of assessment tools, developed by Professor Anna Barnett and colleagues, helps health and education professionals identify movement and handwriting problems, and to plan and deliver effective support in primary and secondary school and in further/higher education.

Professor Barnett's research has resulted in four new standardised tools. The Movement ABC-2 Test and Checklist assess motor skills. The test has been described in Canada as 'the ideal tool' for professionals to confirm diagnosis of developmental coordination disorder – DCD – which affects around 5-6% of schoolchildren and 'take the critical first step' in signposting relevant developmental pathways. The Detailed Assessment of Speed of Handwriting – the DASH – is used to identify children with slow handwriting, while the DASH 17+ is an extension for 17–25-year-olds. Motor and handwriting difficulties are common in DCD, dyslexia and autistic spectrum disorder and using these tests to identify problems early on cannot only widen access to special provisions, but also relieve distress. As one young person put it, 'I'm really slow with my handwriting [...] when my tutor got the results (from DASH) I was allowed to use a computer for my exams. This helps me a lot.'

The DASH and Movement ABC-2 tests are recognised worldwide as valuable assessment tools in educational and clinical contexts.

The Movement ABC-2 test has been translated into over 15 languages and is recommended in international clinical guidelines. It was described by Action Medical Research as 'one of the most popular and respected tests worldwide for the assessment of motor skills.' It is also being used in

developmental medicine, for example in studying the development of prematurely born babies. Meanwhile, the DASH is used as evidence in applications for supporting access arrangements, with staff at UCL's Institute of Education recognising its use in identifying areas where support and progress monitoring are needed. The DASH 17+ is similarly used in further education, with one tutor at a London university claiming to use it routinely as part of assessments for exam access arrangements.

Anna's expertise and the development of these tests have had a huge impact for children and young people struggling with movement and handwriting. By providing reliable assessment tools, this enables the best support to be put in place, helping to boost their confidence and to fulfil their potential both in education and later life.

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**PROFESSOR ANNA BARNETT**  
Professor in Psychology



## Inside UKRI's New £7 Million Research Body and Brookes' Part In It

Professor Tim Vorley, Pro Vice-Chancellor of Oxford Brookes and Dean of Oxford Brookes Business School, will lead the new Innovation and Research Caucus (IRC), a network led by Brookes, which aims to be a world-leading centre of excellence for innovation and research policy. It will bring together academics from many UK universities, with several figures from Oxford Brookes fulfilling key roles in it.

From 2007 until June 2023, the Economic and Social Research Council and Innovate UK co-funded the Innovation Caucus led by Professor Vorley, who in 2023 was awarded an OBE for services to Enterprise, Entrepreneurship and Innovation. The caucus developed into a valuable asset, providing expert advice and evidence to support UKRI to better understand and support sustainable, innovation-led growth. Now, however, a new network which aims to establish itself as a world-leading centre of excellence for innovation and research policy will bring together academics from universities across the UK led by Oxford Brookes. Professor Vorley will lead the new Innovation and Research Caucus (IRC) with Professor Stephen Roper, Professor of Enterprise at Warwick Business School.

UKRI has invested £7m to create the IRC. Professor Vorley said: 'I am delighted to be co-directing this flagship investment with Professor Roper, which brings together leading researchers from Oxford Brookes, Warwick, Manchester, Birkbeck and Cambridge universities. The IRC will adopt an interdisciplinary approach and convene a network of academics from across the UK to deliver applied and actionable insights on research and innovation policy development, implementation and evaluation for UKRI.' The IRC has three co-investigators based at Oxford Brookes Business School;

Dr Syahirah Abdul Rahman, Dr Lauren Tuckerman and Dr Jen Nelles. In addition, there will be four postdoctoral researchers based at Oxford Brookes, working with colleagues across the wider network.

Professor Dame Ottoline Leyser, UKRI Chief Executive, said: 'UKRI needs access to a robust and actionable evidence base. It also needs to bring together people with different skill sets and experience, who can work with UKRI to understand and implement the changes needed to build a thriving, inclusive research and innovation system which delivers for citizens across the UK. The IRC will have a vital role to play in providing powerful insights into what works, where and why. I look forward to working with the Caucus to create and use those insights to optimise the support we provide to the UK's outstanding research and innovation system.'

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**PROFESSOR TIM VORLEY**  
Pro-Vice Chancellor, Dean  
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## Edible Streets – Locally Grown Food For A Healthier Planet

When Dr Mina Samangooei and Dr Sangeetha Thondre met during an online networking event hosted by Brookes, they discovered a shared curiosity in bringing sustainable food production to urban areas. This would increase biodiversity and help combat climate change. They undertook a 3-month project, funded by Brookes, to test the feasibility of creating Edible Streets in Oxford, leading to the start of a fascinating interdisciplinary project.

‘Our current food system is highly fragile and unsustainable, causing greenhouse gas emissions, deforestation and biodiversity decline. Recent issues like Covid, supply chain failures and the cost of living crisis have only made things worse. The Edible Streets initiative encourages food growing on publicly accessible land to encourage health for the mind, the body, and the world. It will hopefully provide increased access to fresh food for a diverse range of people, promoting community cohesion as well as wellbeing.

The influence of media and technology on young people today is no bad thing, but it can disconnect them from nature and healthy habits. For that reason, it matters to us to involve them in research like ours. Fostering their interest in science, and inspiring them to make change in their communities, is deeply relevant to the work of Edible Streets. Our initiative aims to promote food waste reduction, cooking and eating sustainably sourced food, and nurturing green spaces. All of these are habits we hope to impart on young people.

Edible Streets received further funding in 2023, with a Partnership Award with Oxford Brookes

University. It has funded the design and build of new planters in Barton for growing, seating, composting and water collection. Nearby QR codes enable Barton residents to join the WhatsApp group, and link to the project website with recipes using the plants. With further funding from Oxfordshire County Council, we are also developing a How To... guide for public use, using information collected from the Oxford community. The data analysis will highlight key themes, to shape our research further. The research team includes Lucy Crombie, Kuhu Gupta and Dr Mohammad Seddighi.

We feel we have made good strides, but the process of growing food in public spaces would encourage more public involvement if it were simpler. Residents on a street ought to be able to grow food in the verges in front of their houses or apartments, but at present it is more complicated than that. Simplification and policy change would encourage more involvement and make our work more fruitful (pun intended).’

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**DR MINA SAMANGOOEI**  
Senior Lecturer in Architecture



**DR SANGEETHA THONDRE**  
Senior Lecturer in Nutrition



## Think Human Festival

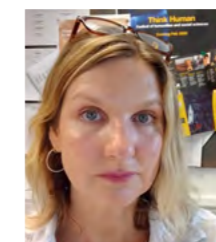
**Think Human Festival showcases humanities and social sciences’ research, and how it relates to topical issues for diverse audiences in Oxford and beyond. Think Human fosters collaborations and partnerships with community groups, arts hubs and third sector organisations, to exchange knowledge and deliver pertinent events and projects. For 2023/24 Think Human looks set to deliver its most engaging programme yet, showcasing research that has both contributed to the success of the Faculty of Humanities and Social Sciences and benefited a wide range of audiences and community groups.**

Think Human strives to deliver events and activities in accessible and entertaining ways: Dance, plays, poetry, comedy and live music feature as often as debates and panels, allowing for an interactive and absorbing experience. The Brookes student body is equally as involved as the audience. Postgraduates devise and demonstrate engagement tools for the Impact of their projects, while undergraduates act as ambassadors for their chosen subjects and alumni devise and lead their own events.

Think Human is significant for its work reaching diverse audiences and engaging with current issues and debate. It demonstrates how research in the Humanities and Social Sciences is vital to understanding and tackling the big questions of our times. Think Human events and activities inspire and connect too. The feedback from collaborators, staff, students and the public is enthusiastically positive. We often hear that colleagues make vital connections that enhance their research and teaching practice, whilst enjoying themselves at the same time.



**PROFESSOR GARY BROWNING**  
Director of the Think Human Festival and Professor of Politics



**LAURA BALDOCK**  
Public Engagement Officer

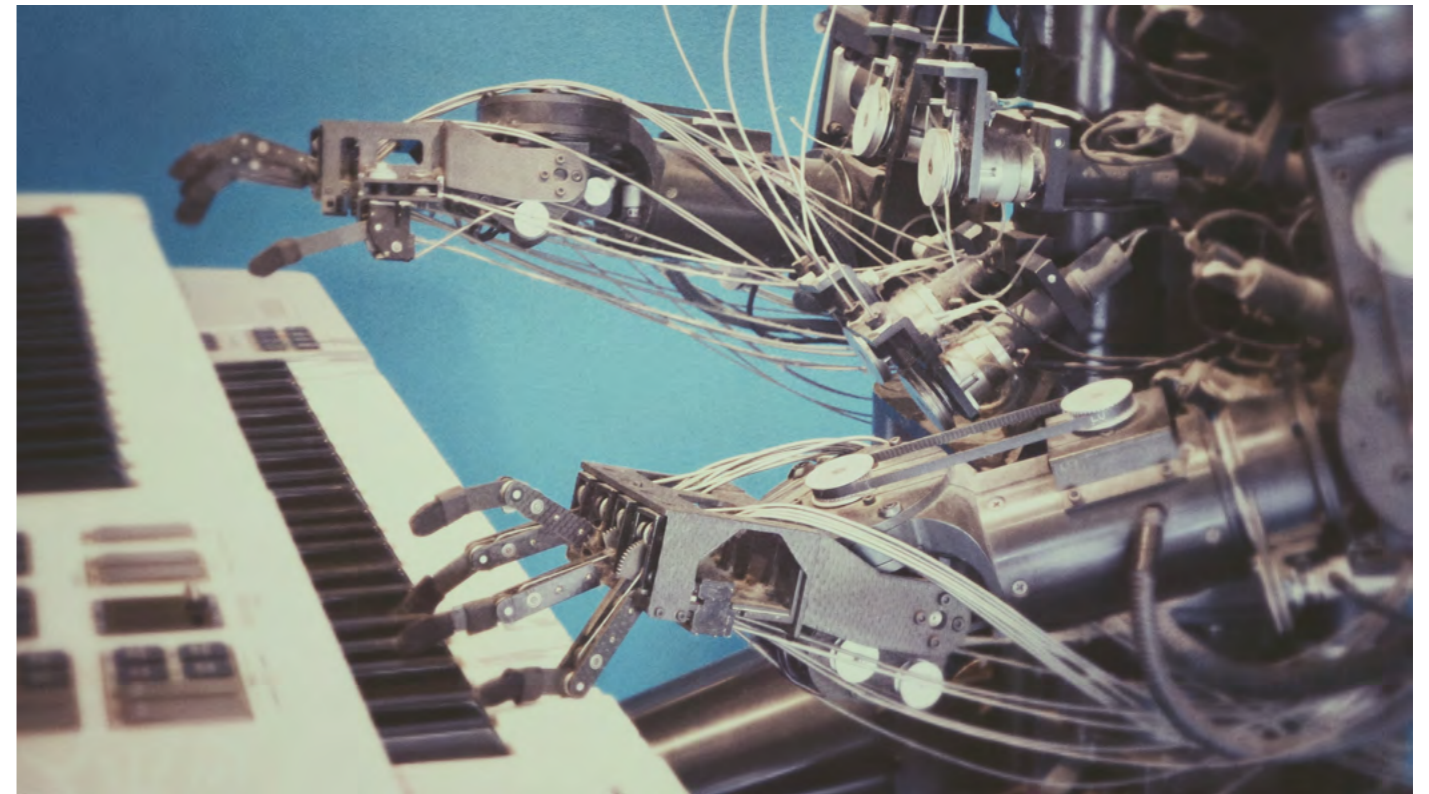
The 2023/24 Think Human programme is taking a slightly different tack to previous years. Rather than confining the calendar of events to biennial festivals, we now have a rolling programme of projects, activities and events throughout the year, among them a performance by Mandala Theatre Company of a new play *MAD(E)*, by Sean Burn about masculinity and mental health, a field trip to a Sustainable Future for Marmalade Festival as part of Skoll World Forum 2023, and events about identity in football and diversifying children’s literature. However, a three-day showcase festival is in the works for April 2024, allowing contributors and attendees the best of both worlds.

Looking to the future, Think Human engagement activity will focus on building partnerships and collaborations that are mutually beneficial. Think Human will continue to promote the message that humanities and social sciences teaching and research hold great value in our society. While STEM is undeniably important to our futures, critical thinking, sensitivity to context and meaning, and our understanding of life’s social dimension are something we cannot afford to lose.

We are excited to announce our next Think Human Festival will take place 17-20 April 2024. All events will highlight the relevance of research in the Humanities and Social Sciences by tackling big questions and issues affecting all of us today, such as AI, migration, eugenics and the forthcoming General Election.

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# Innovation



## Festival of Artificial Intelligence

**This year's Festival of AI, the first of its kind from AIDAN (the Artificial Intelligence and Data Analysis Network), brought together people within Oxford Brookes and outside the university to learn about artificial intelligence and machine learning, and how they relate to developments in the arts, engineering, business, healthcare, law and even philosophy. As one of the university's public engagement initiatives, the Festival aimed to foster innovation in research projects, as well as stoke interest in children and young people who will make up the next generation of workers in AI. Dr Paul Jackson, chair of AIDAN, tells us more.**

The AIDAN Network is a cross-faculty initiative, responding to the growing interest in AI, machine learning and robotics, both at Brookes and beyond its borders. As part of this, the network promotes a range of Knowledge Exchange activities to generate awareness of our research projects, not just among our students and alumni, but also our partners in the wider community – encouraging them to connect with us specifically or with Brookes in general.

By their very nature, the technologies we research are becoming increasingly autonomous. This is both exciting but potentially challenging: the more autonomous anything is, the harder it is to anticipate what it might do. Simply put, there are more risks associated with autonomous systems. Accordingly, delivering “trustworthy AI” is a huge agenda – not just for us, but for the wider scientific

research community. How can we design these machines to be reliable, but not dangerous?

Of course, these questions (as valid as they are) also need to factor in the moral and ethical considerations. If we want our artificial intelligences and thinking machines to be more like humans – in essence, to think like us – we also want them to exhibit human morality. But how can this be achieved, and how is this even possible? Morality isn't even something that all humans can agree on or define, as centuries of philosophical argument can attest. Questions like these are a huge part of AIDAN's work, as well as Brookes Institute for Ethical AI's, which is dedicated to this topic.

Even to those who aren't necessarily 'techy' or in sync with technological stories in current affairs, AI is an issue that still widely touches our lives. ChatGPT is already forcing countless institutions and sectors to rethink their policies and general attitudes towards technological assistance, something that is set to continue. But AI and machine learning also pose new opportunities, as well as challenges. Most businesses would welcome assistance in making their supply chains more efficient, or improving customer experience. As one of our panels at the Festival highlighted, even sectors like Life Sciences stand to gain. AI assistance in automating drug discovery or protein sequencing, for instance, is already helping to identify new cures and treatments for health conditions.



While STEM would strike most people as an obvious field to apply AI in, it can also have as big an impact in the arts and humanities. Generative AI systems can develop prose and poetry, and while the quality of such work is arguably subjective, there is growing interest in how such systems could work with human artists and writers. This raises new questions: what, exactly, is the best fit between people and machines? How can they augment rather than replace human creativity? These are all questions we hope to explore.

As with any (relatively) new scientific breakthrough, there are some applications that cause people fear and concern. AI could certainly be used in warfare to disastrous effect – for example, with the rise of autonomous weaponry. But even away from the battlefield, cyber attacks and ransomware are not new, and areas where artificial intelligence could raise the stakes further. There is no denying that this new potential has a darker side.

The first Festival got off to a terrific start, and we have plans for where we would like to take it in 2024. We hope that next year's event will be more in-person (this year's was mostly online), which will allow us to make activities more interactive. We want delegates to literally get to grips with the technology in physical spaces, and talk to our researchers as they do so! We also have plans to continue the public engagement aspect of the Festival, reaching out to local businesses and schools to raise awareness, not only of the technology itself, but of also its potential as a field of business enhancement, study and work. There is so much to computer science beyond white coats and mathematicians. Wherever your interests and academic specialisms lie, the world of AI will have a role for you.

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**DR PAUL JACKSON**  
Senior Lecturer



## Accelerating Progress on Electric-powered Transport

**The race towards our government's 2050 target of total transport electrification is in full flow. Accordingly, so is the need to mass produce the next generation of more efficient, more reliable and more powerful electric vehicles, in less time, for less money and using less material. Ten years of crucial research at Oxford Brookes' Joining Technology Research Centre (JTRC)'s led by Professor James Broughton, has added significantly towards the UK automotive industry's progress.**

YASA Motors is just one example of the innovative work and research undertaken within the Joining Technology Research Centre (JTRC) within the School of Engineering, Computing and Mathematics (ECM). Early YASA prototypes, despite being smaller and lighter than conventional alternatives, were slow and expensive to build, and had an unacceptable defect rate. Significantly, the motors were heavily reliant on adhesive bonding technologies and experts within JTRC were able to identify and suggest fixes for many of these issues. They identified an improved bonding process, suggested improved manufacturing procedures as well as a quicker and cheaper motor production process, new lightweight injection-moulded composite materials and many other examples of improvements. Beyond this technical support, the JTRC also provided more holistic help as well, supporting the patenting of bonded manufacturing processes, and investigating more general design improvements such as novel cooling mechanisms.

These results are set to have long lasting implications for YASA, paving its way towards inclusion in lower cost electric vehicle production. In 12 years of involvement with the JTRC and ECM, including many placement and graduate employees

form ECM, YASA has grown from 12 employees producing less than 50 motors per annum, to over 150 employees capable of producing 100,000 motors per annum. The P400 motor manufacturing process, which first benefited from these improvements, was reduced from 7 to 2 days, with estimated savings of £16.7 million per year. Defect rates fell by a factor of 100, with further estimated savings of another £100,000 annually, while yet another £1.14 million per 3,000 motors was saved by reduced part costs.

The improved motor was to be incorporated into the Jaguar C-X75 supercar, dubbed 'the most technologically-advanced road car ever conceived' until its production was unfortunately cancelled. YASA motors have also been adopted in other high-end sports cars and even in hovercraft design. The company became a partner in the Accelerating the Electrification of Flight (ACCEL) project, to help develop what will hopefully be the world's fastest all-electric aeroplane. In 2021 Mercedes-Benz acquired YASA, giving it access to the UK-based operation's axial flux motor technology and expertise. A new company, Evolito, was spun out by YASA to commercialise its next-generation electric motor technology and IP for the rapidly-growing aerospace market.

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**PROFESSOR JAMES G BROUGHTON**  
Professor in Engineering



## Women, STEM and Investment: Closing the Gender Gap

**University spinouts are critical to the UK innovation ecosystem and can provide great societal benefits, by bringing to market new treatments for illnesses and new technologies in multiple fields. Investment in these companies has increased fivefold over the last few years, but this funding is less likely to benefit female researchers, as they are still significantly underrepresented as spinout founders. Oxford Brookes joined forces with the UK Business Angel Association to address this problem.**

Research led by Professor Simonetta Manfredi, funded by the Engineering and Physical Sciences Research Council under its Inclusion Matters programme to increase women spinout leadership participation, highlighted that a major challenge for female founders is securing investment to develop and grow their businesses. The Women Angel Insights Report shows that female business angel investors are more likely to invest in women-founded companies.

However, female angel investors represent only 14% of their investment community. Thus, there is scope for female spinout founders and female angel investors to work together to close the gender investment gap.

Oxford Brookes joined forces with the Women backing Women campaign, launched by the UK Association of Business Angels, to address similar issues highlighted by the Rose review on female entrepreneurs in the UK. To find solutions to resolve these issues, a highly successful event was held at Brookes, in collaboration with Jenny Tooth OBE, Executive Chair of the UKBAA. It brought together female researchers in STEM and founders of university spinouts and female Business Angels and investors, as well as key figures from the enterprise ecosystem including Innovate UK, the Royal Academy of Engineering, the Royal Society of Chemistry, the Francis Crick Institute, UKBAA, British Business Bank and the NatWest Group.

In a series of panel discussions throughout the event, a number of themes emerged and clear calls for action were made signalling how to close the gender gap, and begin to address other inequalities across the system. These included:

- Achieving a target of 30% for both female founders and business angels to increase the proportion of university spinouts with at least one female founder and of female Business Angels by 2030.
- Working better together to harness our combined forces, through initiatives like the Women backing Women campaign to have greater impact.
- Challenging the existing narratives and change cultures to create more enabling environments for women innovators and to encourage more women in STEM to become business angels investors.

One of the participants, Dr Natalie Curtis, who is just 27 and the CEO of an Oxford Brookes spinout company Oxford Target Therapeutics encouraged more female researchers to embark on the spinout pathway by saying:

‘The journey is only just beginning in terms of the company. Cancer touches everyone’s lives and if I can make a difference, that is fantastic. From where my PhD journey began and what it has led to, I could never have imagined. My ultimate goal is to revolutionise cancer treatment and improve the quality of life of cancer patients. I hope in turn this will inspire future generations of students to follow their passions and goals and that they too can achieve anything they aspire to.’

Natalie, who did her PhD at Oxford Brookes, is working in collaboration with Dr Victor Bolanos-Garcia to develop a potential treatment for triple negative breast cancer – the deadliest form of the disease which is often incurable.

The event concluded with a dinner attended by Professor Irene Tracy, Vice-Chancellor of Oxford University, who spoke about the review on university spinout companies that she was leading on behalf of HM Treasury, and offered an opportunity to participants to share their thoughts on how to achieve a more gender inclusive spinout ecosystem.

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**PROFESSOR SIMONETTA MANFREDI**  
Director of Research, Innovation and Enterprise



# Enterprise



## Bringing Enterprise to the Heart of Campus: Oxford Brookes Enterprise Centre

**Oxford Brookes Enterprise Centre was officially opened in September 2022 to complement the existing Bioinnovation Hub. Together, they offer lab, office, and meeting spaces, and facilitate holistic business growth support to life science and digital startup and spinout companies.**

**The Enterprise Centre's position in the heart of the Headington Campus is attractive to both internal and external businesses, with its close proximity to facilities, academic expertise, and student and graduate talent pipeline, to enable those businesses to grow and flourish.**

One of the Centre's core aims is to provide mutual benefit to both the supported businesses, and the University community by facilitating relationships between academics and industry figures, and providing opportunities for students to experience enterprise in action. During this first year of activity, the Centre has supported internships in 2022 for three Business & Marketing students, two of whom were employed by the companies after completing their placements. More recently companies have hosted research projects, employed final year Biology students as junior research assistants, as well as hosting doctoral training programme placements and interns from Oxford Brookes and other UK universities. In each case the collaboration

was synergistic; students and academics took new career steps, while the companies gained new insights into marketing and applying their research.

Thanks to the existing relationship with (and generosity of) Santander Universities, it has also been possible to enable Santander funded internships, both within the Enterprise Centre and externally in Oxford, again adding value to the enterprise ecosystem.

From the autumn of 2023, the Enterprise Centre will also be home to the Brookes Enterprise Support team, which fosters enterprising skills and attributes in the student and recent graduate population, and provides support to enable self-employment and business startup. The team will be strengthened by the addition of in-house business advisors, to facilitate the university's ambition to increase its number of student/graduate startups. The Associate Director for Enterprise, Dr Philip Clegg, commented that, 'by co-locating our Brookes Enterprise Support Team within the wider Enterprise Centre, we provide both a source of inspiration to those pre-start/early stage student-led businesses, and a community of enterprising students and graduates to potentially add further value to the scaling of businesses already located there.'



**The Sun Bear Biofuture team, from left:**  
Ben Wilding, Chief Executive officer; Ben Williams, Chief Technical Officer;  
Laura Van Marrewijk, Chief Scientific Officer

## Our members' work

A diverse variety of work is conducted by the companies currently based at the Centre and there have already been some notable success stories. Two businesses which have recently been awarded Government funding to develop food products using sustainable, low-carbon processes are Sun Bear Biofuture and Fermtech.

The teams at Sun Bear Biofuture and Fermtech are both passionate about protecting the environment. The companies have each been awarded funding from the prestigious Innovate UK scheme for their work. Innovate UK is the Government's flagship grant programme. It awards £125 million to British businesses every year for tech and innovation based projects. Sun Bear Biofuture was awarded a £500,000 Innovate UK Smart Grant to further its research into developing an alternative to palm oil, which is widely used as an ingredient in common foods such as cake and biscuits and household products such as shampoo.

Ben Wilding, CEO, explained that palm oil production in countries such as Indonesia and Malaysia had resulted in extensive deforestation, destroying the habitats of many endangered and critically endangered species, including sun bears.

Ben said: 'In South East Asia there are only about 1,000 sun bears left due to deforestation. We have adopted a sun bear which is cared for at the Bornean Sun Bear Conservation Centre.' The Sun Bear Biofuture team is developing a yeast strain that can produce commercially viable quantities of oil through fermentation and cutting edge scientific research and development. Their estimates predict a land use saving of 80% and a carbon reduction of 80% on current oil palm production.

Ben added: 'We are working with a company that has tonnes and tonnes of potato peel as a waste product we can use as a feedstock. Using waste from agriculture is good business for farmers and lowers our environmental impact. We are in the research and development stage and will be sending samples to potential partners and customers by the end of the year.'

Fermtech recently received a £50,000 Transformative Technologies grant from Innovate UK to support the next stage of its research to develop technology for producing protein from food waste. Fermtech also received £50,000 from the Oxfordshire Local Enterprise Partnership (OxLEP), and was voted the partnership's Most Innovative Company.

Fermtech uses fungi grown on spent grains from the Oxford-based Tap Social Movement's brewery to extract protein for use in vegan cheeses. CEO Andy Clayton, said: 'Fungi are the world's natural decomposers. They are great at turning waste into things of value. In the near future we're all going to experience more and more products that contain or are made by fungi. We are working on getting textures and flavours right with consumers, so we can start to scale up production. We will then target a wider range of plant-based foods and spreads, as well as complex proteins such as enzymes.'

I'm proud to be from Oxford and to be working out of the Oxford Brookes Bioinnovation Hub, part of the Enterprise Centre. It's the perfect place for us to develop our products.'





### A venue for learning

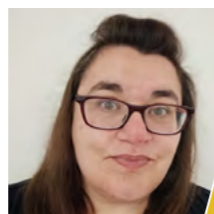
The Centre has hosted a number of talks and networking events during its first year, which not only add value for those located there, but also attracts external businesses and professionals onto campus to further enhance and develop the university's excellent existing relationships with the SME community. The Centre also acts as a valuable signpost to other business support organisations, events and specialist networks, enabled by its own network with valued local and regional partners. Bioinnovation Hub manager Dr Sarah Irons said, 'In developing connections locally and nationally we're able to proudly spread the message about the important work and opportunities here at the University. Also we are forming beneficial links with local institutions to build "power in place". A great example of this is Headington's Health and Life Sciences Cluster, where colleagues from the Oxford Trust, WCFI, Bioescalator, Eagle Labs, The Hill, Oxford Innovation and University of Oxford Enspire team, join together to develop a local identity of Headington as the launchpad for companies within Oxfordshire.'

### Our first year achievements

The Enterprise Centre's ambition and development was enabled via the Oxfordshire Local Enterprise Partnership's (OxLEP) support to access the Government's Local Growth Fund. The return on that investment requires the creation of 17 new businesses and the growth of startups via the creation of 74 new jobs over the Enterprise Centre project's 3 year duration. Oxford Brookes and OxLEP are delighted to report that at the end of the first year of the project, all targets have been met and/or exceeded; paving the way for an exciting future of enterprise activity at Oxford Brookes University.

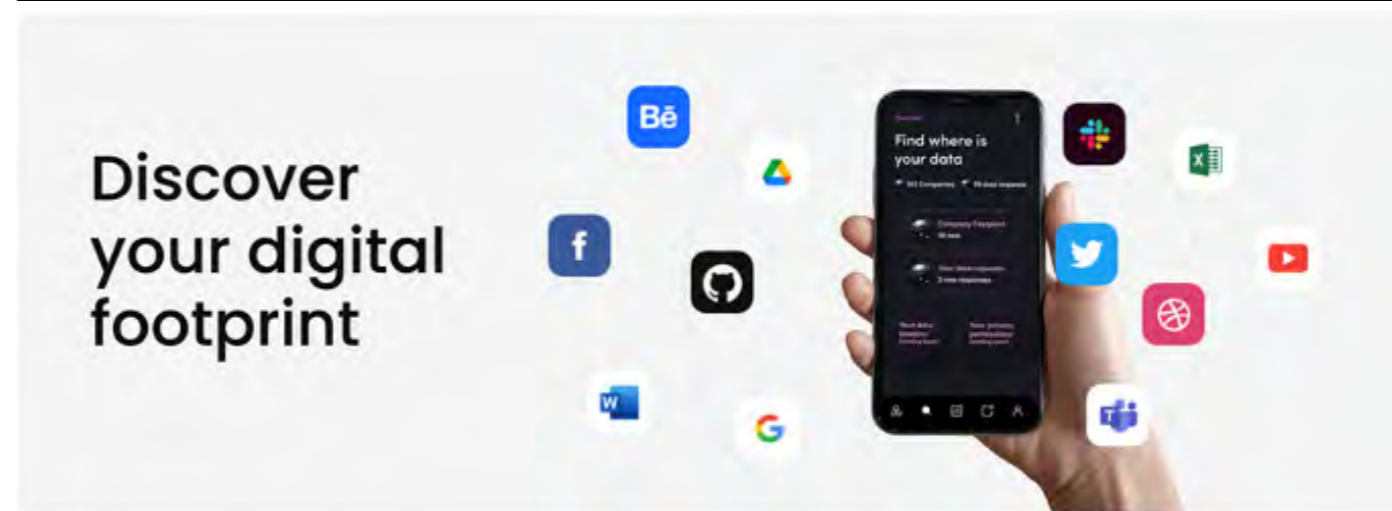


**DR PHILIP CLEGG**  
Associate Director - Enterprise



**DR SARAH IRONS**  
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### Nurturing The Next Generation of Entrepreneurs and Startups

**In our interconnected world, data privacy has emerged as a critical concern. Navigating the vast digital landscape necessitates the ability to monitor, manage, and safeguard our valuable data. Jasraj Singh, a recent Oxford Brookes University Business School graduate, is on a mission to help us manage our digital footprints safely. Through his privacy-tech startup Wisard, Jasraj is democratising data privacy, ushering in a new era of informed decision-making and data protection.**

'At its core, Wisard is a software and privacy-first startup dedicated to providing a smart data privacy assistant. While working as a brand consultant in the marketing and advertising sector, I realised how the existing system of data ownership is flawed, with data privacy predominantly controlled and dictated by businesses. Wisard's mission is to empower individuals and businesses with a comprehensive view of their digital footprints across multiple platforms, enabling them to make informed decisions about data sharing and privacy. Through an intuitive online app, Wisard empowers users to regain control of their personal data, making privacy a deliberate choice rather than an afterthought.'

The journey so far has had its twists and challenges. After multiple rounds of surveys, interviews and product testing, Wisard secured a successful round of investment. Oxford Brookes' unwavering support and commitment to foster entrepreneurship proved to be invaluable during this process. Through targeted events and programs, Brookes equipped my team with the necessary

resources and guidance for success. Additionally, the provision of an incubation space to effectively manage Wisard's team during ideation and development stages was crucial.

I firmly believe in the role of universities and the government in supporting young entrepreneurs. In the future, I'd like to see special funding opportunities be available for pre-revenue or pre-product phase tech startups, helping them to truly transform ideas into reality. Moreover, dedicated startup advisors and mentors provide invaluable guidance, expertise, and connections, enabling budding entrepreneurs to navigate the entrepreneurial landscape with confidence.

Looking ahead, I foresee Wisard as an established company, nurturing active conversations about data privacy and empowering individuals to safeguard their digital identities. Furthermore, I see us expanding our offerings to encompass robust enterprise solutions, becoming a trusted name in the realm of data privacy. Only then will Wisard be able to democratise the data privacy landscape.'

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**JASRAJ SINGH**  
Founder of Wisard

# Developing the Talent Pipeline



## The Science of Heartbreak – How Researchers Tackle 'Abstract' Subjects

Studying for an MA in Modern History at King's College London kindled Dr Sally Holloway's interest in the history of love, around the same time that the history of emotions was emerging as a field of enquiry. It was during this period that she discovered a bundle of adulterous love letters in the archives, written in code, which would later become the subject of her first article. Holloway's doctorate deepened her interest in love and romance, examining the history of courtship in Georgian England. This research would form the basis of her first book, *The Game of Love in Georgian England*, as well as lay the groundwork for her current work.

'My work has examined the material culture of courtship, such as the role played by food gifts in securing unions, and the nature and significance of written proposals of marriage. My next research project will unpack what occurs after love, examining romantic heartbreak as an embodied emotional experience.'

Before joining Brookes, I taught at a liberal arts university, helping students specialising in a variety of subjects to engage with and make links with different fields. It can sometimes be difficult to grapple with ideas which originate from such different starting points, but equally can be an enormously rewarding exercise. Accordingly, during my time at Brookes, I have worked to highlight intersections and promote cross-Faculty dialogue between scholars, notably by co-organising the Emotions Across Disciplines seminar series with sociologist Dr Alexandra Macht in 2017, and the Language and Emotion workshop with geographer Dr Ingrid Medby in 2018. These events enabled scholars in different fields to productively engage with one another, make connections, and generate new ideas about emotions and emotional expression.

For a topic like heartbreak, that has generated so much philosophical, sociological and psychological discussion, working across multiple academic disciplines can be a particularly productive approach.

Heartbreak also offers great scope for public engagement work, since most of us have either suffered, or will suffer, from it. My new AHRC-funded project, *After Love*, aims to set a new interdisciplinary research agenda for the study of heartbreak, reaching beyond the humanities by uniting artists, poets, wellbeing practitioners, medical professionals with scholars of emotions, gender, the family, medicine and embodiment to create an innovative new understanding of how humans hurt, and heal, from a broken heart. *After Love* also furthers UKRI's strategic aim to improve the nation's health and wellbeing, by creating a new and desperately needed public space to discuss the mental and physical implications of heartbreak in a scholarly yet accessible way.

As an ECR it can often be a difficult balancing act between developing a research profile and working across several (often precarious) teaching jobs, whilst attending networking events such as conferences. In 2016 I was awarded an Early Career International Research Fellowship by the Australian Research Council Centre for Excellence for the History of Emotions, which was formative in helping me to build my own profile, publications, and academic network. ECRs often find themselves with little job security, so seeing longer-term contracts (that allow more 'breathing space' and reduce the time spent hurriedly applying for new roles) would certainly ease anxieties, as well as offering more contracts which extend over the summer where (paid) time can be spent on research. It would also help for universities to better integrate ECRs into their research culture, through conferences, seminars, departmental newsletters, and training events. Research can often be an isolating experience, so taking time to shine a spotlight on their work and keeping them abreast of opportunities can be vitally important in spearheading careers in academia.'

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**DR SALLY HOLLOWAY**  
Vice Chancellor's Research  
Fellow in History & History of Art



## Fitness in Teens – Combining Research and Policymaking

**Sam Burden's forays into medical science at undergraduate level – and his curiosity into the 'why' behind much of his studies – led him towards research as a general discipline, combining his undergraduate studies in cardiac anatomy with his practical experience of coaching sports events for children. His PhD examines early risk factors in adolescents, such as obesity and low physical activity, and how it is linked with impairments of cardiac function. As part of the national STEM for Britain campaign, aimed at bringing together young researchers and governmental policymakers, Sam presented the findings of his research to the Houses of Parliament.**

'STEM for Britain was such a positive experience for me, to see the fascinating examples of work across disciplines, first and foremost. But it was also a fantastic chance to demonstrate to several MPs the brilliant work young scientists are doing across Britain. Early Career Researchers in the top scientific research groups tend to be the staff members performing most of the data collection and interpretation, so their perspective is unique and highly informed. Dr Anneliese Dodds, MP for Oxford, found my research on encouraging healthy and active lifestyles in children and adolescents to be engaging and interesting, and saw the relevance of it for reducing the burden on healthcare services. MPs are able to affect change, and the researchers have insight into what needs changing, so putting the two together is a golden opportunity. I hope that my work, and that of others, implants in politicians' and leading scientists' minds that child and adolescent physical activity guidelines may need to be changed.

The campaign is just one example, of course. There are other ways to put research like mine to practical use. Conferences are always useful places for like-minded researchers to share experiences and listen to new results. My work tends to be hands-on, so interactive days and events are a brilliant way to show it off in understandable – and often quite

memorable – ways. The Oxford Brookes Science Bazaars are a great example, demonstrating not only the things we do but why they are important, and just how easily they can change people's lives for the better. I'd love to get MPs to come to such events, as they would make the case far more memorable than presenting information to them at conferences.

The message of getting children fitter and healthier is hardly new, but I'd argue it has never been more important. Our modern environment sees rates of childhood obesity rise, and levels of child exercise fall, something that Covid has only made worse. We see patterns in the data we collect, and they aren't unrelated; hours of PE tuition in schools are falling. Incidence of Type 2 diabetes and early-stage cardiovascular disease are rising. Accordingly, I believe this work to be important not only from a health perspective (forming good lifestyle habits in early life is especially important, as this is a likely way they will continue to be healthy into adulthood), but also from a socio-economic perspective (as preventing cardiovascular conditions, rather than treating them, is acknowledged to be a key way to ease pressure on healthcare services). High-intensity physical activity can give young people the best chance of having a healthy cardiovascular system for longer and avoid falling victim to the world's most prolific contributor to poor health and death.

My PhD journey, like most postgraduates, has been far from easy, but the truth is I have enjoyed every moment of it. It was always going to be a tremendous learning curve, and external factors like Covid certainly made it harder, but I was lucky to be surrounded by a highly supportive and capable team at both Oxford University and here at Brookes. I had brilliant and dedicated supervisors – hardly the absentee supervision you hear horror stories about – who certainly pushed me hard at times, but looking back, it was undeniably what I needed, and yielded worthwhile results. As for the future, I feel I have more to give to academia – I've started a post-doctoral research position at King's College London, giving me the opportunity to continue my cardiovascular prevention research. But I also aspire for a clinical research career, and accordingly, I hope to gain a qualification in echocardiography too!

### For more information:

<https://www.cbsnews.com/miami/news/study-teens-daily-exercise-stay-healthy/>



**SAM BURDEN**  
PhD student at Oxford Brookes



## 'A Tale of Two Universities' – The Doctoral Training Programme in Action

**After completing a Human Biology BSc at Loughborough and an Oncology Masters at Nottingham, Joanna Cull worked in industry at Oxford Immunotec before returning to Brookes to begin her PhD. But this would be no ordinary postgraduate degree – having gained a place on the 4-year Doctoral Training Programme, Joanna would undertake her PhD in partnership between Brookes and Oxford University, exposing herself to unique opportunities and resources that not every student gets to experience.**

'The team at Oxford Immunotec were brilliant, and I really enjoyed my time there, but as a technician I lacked the freedom and diversity of day-to-day work that academia offers. So I knew for some time that a PhD was what I wanted, but as any postgraduate will tell you, finding an opportunity to do one isn't always a straightforward guarantee. In my case, after identifying and meeting with the Extracellular Vesicles and Cancer Biology research group at Oxford Brookes, I learnt about the Oxford Interdisciplinary Bioscience doctoral training partnership programme, which I applied for and was fortunate enough to gain a place on.

The Doctoral Training Programme (DTP) is a 4-year PhD programme, which I am 3 years into, funded by the Biotechnology and Biological Science Research Council. The first year comprises of quantitative and computational bioscience modules as well as two 12-week rotation projects that you write short dissertations on, giving you a fantastic grounding in the techniques and workstyle needed for a PhD. The remaining three years are spent on the PhD itself – in my case, the regulation and plasticity of protein glycosylation in breast epithelial cells –

during which, as one final mandatory requirement, you undertake a 12-week professional internship.

Doing this degree in partnership with two world-renowned universities is a unique experience, undoubtedly. I benefit from training opportunities and professional interactions from both institutions – there is simply more on offer than doing it at one! I have trained in areas like public engagement with research and event delivery, and through Oxford, I completed a course on learning and teaching, as well as demonstrated on a module. Similarly, the mandatory internship also sets this programme apart from regular PhDs; even for someone who had already worked in industry, it gave a valuable new perspective. Students doing regular PhDs, conversely, may not even have time to fit such a commitment into their schedule.

Going into this programme, I was pleasantly surprised by the consistent supervision and support I had from both universities. I meet weekly with my supervisor and supervisory team to discuss my research and progress, which is invaluable for pushing the project along and supporting me personally. We also have weekly group meetings in the labs, which is personally crucial, as PhDs can often be quite solitary affairs. And lastly, as a DTP candidate, I don't worry particularly about my timeframe spiralling or changing, as I put forward a project proposal ahead of time, and then defend with a viva. This ensures my plans are achievable in the set time, and necessitates mapping out those goals accurately and realistically, as well as holding myself accountable in fulfilling them.'

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**JOANNA CULL**  
PhD student at Oxford Brookes

# FUTURE THINKERS



## Studying Family Lives and How These Are Changing

**Professor Tina Miller is a sociologist whose research focuses on change and continuities in family lives, focusing in particular on periods of significant transition. Most notably these have included transitions to first-time motherhood and fatherhood and how caring, parenting and work lives are choreographed and ‘managed’. With over 25 years of research experience, Tina has been able to actively lobby for change and influence policy and practise in relation to gendered and other inequalities related to family lives.**

In contrast to, and complementing large scale quantitative data, Tina has specialised in using qualitative longitudinal research, following samples through unfolding and real-time transformations, using in-depth, interview-based data collection. This has led to findings which are recognisable to others and reflective of majority experiences of the same transformation (e.g. transition to first-time fatherhood) and helps to explain in more detailed and nuanced ways, patterns found in larger-scale data sets.

Taking this approach, Tina’s research findings have led to high level, international appointments, focused on issues of gender equality and reproductive wellbeing. Invitations and stakeholder collaborations have included being appointed to represent the UK at the EU Gender Equality meeting on ‘Instruments to foster long-term paternal involvement in family work’ (Berlin, October 2018), working with the Government’s Equality Office and Women and Equalities Committee on parental leave policies and producing guidelines for the World Health Organisation on changing Traditional Birth Attendant Practise. She has also worked with MP David Lammy on reviewing Labour party policies on Fatherhood and most recently authored three BBC Radio 4 Analysis Radio programmes, based on her findings from her research which are now available

as podcasts: ‘**Modern Parenthood**’; ‘**Why do we assume Women Care?**’; ‘**What’s Changing about Childbirth**’.

Tina’s most recent research has involved repeating her first Transition to Motherhood study, 21 years after the original. The findings from this study will be published as her fourth Cambridge University Press monograph in December 2023 (‘Motherhood: Contemporary Experiences and Generational Change’). Tina is now turning her attention to a new research project, which develops her focus on family lives and will examine how ‘family’ is conceptualised in times of crisis and related policy responses. This follows an earlier BA project on which she was PI – ‘Being a Syrian Refugee and a Dad’ – which was shortlisted for the Research Project of the Year: Arts, Humanities & Social Sciences category of the Times Higher Education Awards. Her new study will examine how ‘family’ has been conceptualised and understood/practised in the UK ‘Homes for Ukrainians’ sponsorship scheme. This so-called ‘bespoke humanitarian support package’ (Home Office, 2022) differed in many respects from other government responses to refuge sought in response to war and is premised on apparently, unproblematic ideas of ‘the family’. The study will examine how the scheme has been experienced, especially by those becoming ‘hosts’. What can be learnt from the scheme as mobilities through crisis (e.g. as a consequence of war and climate emergencies) are set to increase. What should ‘humanitarian’ responses look like?

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