



MANCHESTER
1824

The University of Manchester

The University of Manchester
A global institution

The University of Manchester is an internationally renowned institution with a reputation for research and teaching excellence, driven – always – by innovation.

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Foreword

The world's greatest challenges transcend borders. From pandemics to energy crises, humanitarian disasters to climate change, it is through international partnerships that we can help create a fairer, greener and healthier world. Our leading research capabilities, combined with our commitment to social responsibility, make us the perfect partner in innovation and discovery.

We are the only university to consistently rank in the top ten in the *Times Higher Education* Impact Rankings, for our contribution towards delivering the United Nations' Sustainable Development Goals (SDGs). In the QS World University Rankings 2024, we ranked 32nd in the world and our contribution to the global sustainability effort has gained us the number one ranking in Europe in the QS World University Sustainability Rankings. Our rankings also include being 41st in the world and 10th in Europe in the Academic Ranking of World Universities 2023 (Shanghai Index) and the 8th Most Innovative Institution in Europe (Reuters).

We combine expertise from across disciplines to find solutions to pressing problems in key areas including cancer, poverty and energy. Through partnering with fellow leading institutions, we give students the opportunity to access the best teaching and learning experiences, here in Manchester and abroad. We also connect with businesses, large and small, to exchange knowledge, advance new technologies and help bring crucial products to market. Our innovation capabilities are second to none – from the first stored-program computer to the isolation of graphene, we are always at the forefront of new discoveries.

Our people drive our success: whether that's our 46,000 students – a third of whom come from overseas – or our leading academics and staff, forging strong partnerships with fellow institutions and global companies. We have a rich history of academic excellence, with 25 Nobel laureates among our current and former staff and students, and our 500,000-strong alumni community embodies our vision and values across the world.

An integral part in a city of firsts, we draw our pioneering spirit from our home town, Manchester – the birthplace of social movements and industrial innovations that shaped the modern world. For 200 years, we have taken this drive and determination into our global partnerships, inspiring each other to make an impact in communities around the world.

As we look beyond our bicentenary and into our third century, we know that international partnerships and innovation go hand in hand as we tackle natural and societal challenges through interdisciplinary collaboration.

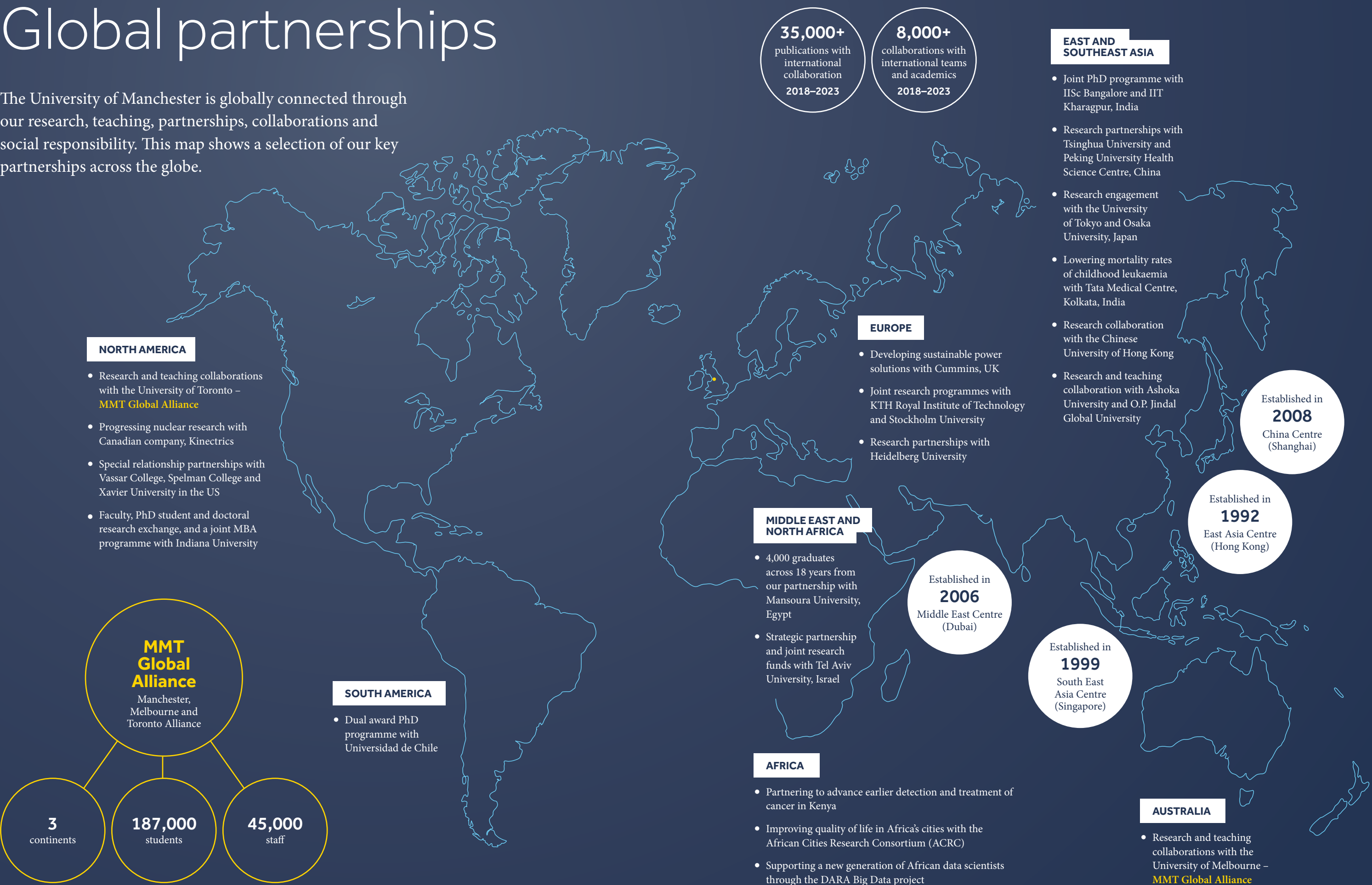


Professor Stephen Flint

Associate Vice-President International
April 2024

Global partnerships

The University of Manchester is globally connected through our research, teaching, partnerships, collaborations and social responsibility. This map shows a selection of our key partnerships across the globe.



How we're making an impact

At Manchester, our research is pushing boundaries to enable a healthier population, create a fairer world and protect our planet. We are driving innovation through global strategic partnerships and collaborations, bringing new ideas to businesses, insight to fellow institutions and creating unforgettable experiences for those who study with us.

Our impact is felt far and wide. In the 2021 Research Excellence Framework – the UK-wide assessment of university research performance – 96% of our research impact activity was assessed as ‘world-leading’ or ‘internationally excellent’. We are also leading the way for social and environmental impact according to the *Times Higher Education* Impact Rankings. We are the

only university to rank in the top ten for five years running, for our work towards the UN’s Sustainable Development Goals.

Across our multi-cultural campus, four global centres and expansive research portfolio, we are tackling key challenges, developing transformative solutions and creating positive change, both for our generation and those to come.



A healthier world

Our researchers are working with partners to provide fairer access to healthcare services and improve the health of global populations.



Developing diagnostic techniques for low-resource settings

In Africa, congenital heart disease is the leading cause of childhood mortality. Cases in the continent make up one third of all congenital birth defects globally. Researchers in Manchester and Cape Town are working together to address knowledge gaps and build research capacity in this field.

Led by Professor Bernard Keavney, Partnerships for Children with Heart Disease In Africa (PROTEA) is developing diagnostic techniques for use in low-resource settings. Using computational fluid dynamics (CFD), researchers have been able to develop a patient-specific pipeline that doesn't rely on expensive technologies like MRI, instead using alternatives like CT and Doppler.



Supporting communities

Led by the Manchester Urban Institute and Sustainable Consumption Institute, the 'smart cities' initiative is looking at ways to optimise urban services, including energy, transport and water, as cities become increasingly pressured by drivers of change. Cities are constantly evolving and so require new technology and increasing engagement from industry, government and citizens to stay ahead. We're working with companies like Siemens, as a global ambassador, to train the next generation of engineers equipped to advance the connectivity, efficiency and sustainability of smart cities. True smart cities must engage their citizens, so we are collaborating with other leading institutions and public sector organisations across Europe as part of SMARTiP – a project funded by the European Commission to empower citizens to become active and involved in their cities.

Our Creative Manchester research platform partners with Manchester

Providing insights on air pollution

In India, our researchers – including Professor of Atmospheric Composition Hugh Coe – are helping to better understand the causes and impact of air pollution. With its chronic levels of air pollution, Delhi provided the perfect case study for this research. In collaboration with the Indian Ministry of Earth Sciences, the Indian Institute

of Tropical Meteorology and Indian Institute of Technology, Madras, we're exploring the connection between pollution and human health. Harnessing our strengths in computer modelling and the local knowledge and understanding found in Indian cities, the project is providing insights to help authorities make informed policy decisions.



Camerata on *Music in Mind*, a programme that uses music and improvisation to help people living with dementia to express themselves and communicate with others. It also trains and supports care workers to deliver the music workshops independently, so the programme can continue benefitting local communities. *Music in Mind* has since been awarded a grant to evaluate the impact of an online version of the programme and how it could be integrated into the fundamentals of the care practice in the future. The programme has also been taken abroad, to benefit partners in Sweden, Taiwan and Japan.

In 2024, Manchester was named a UNESCO City of Lifelong Learning. Our University is a key partner in making lifelong learning a reality for all, and supports the city as it becomes part of the UNESCO Global Network of Learning Cities (GNLC) – made up of 64 cities from 35 countries.





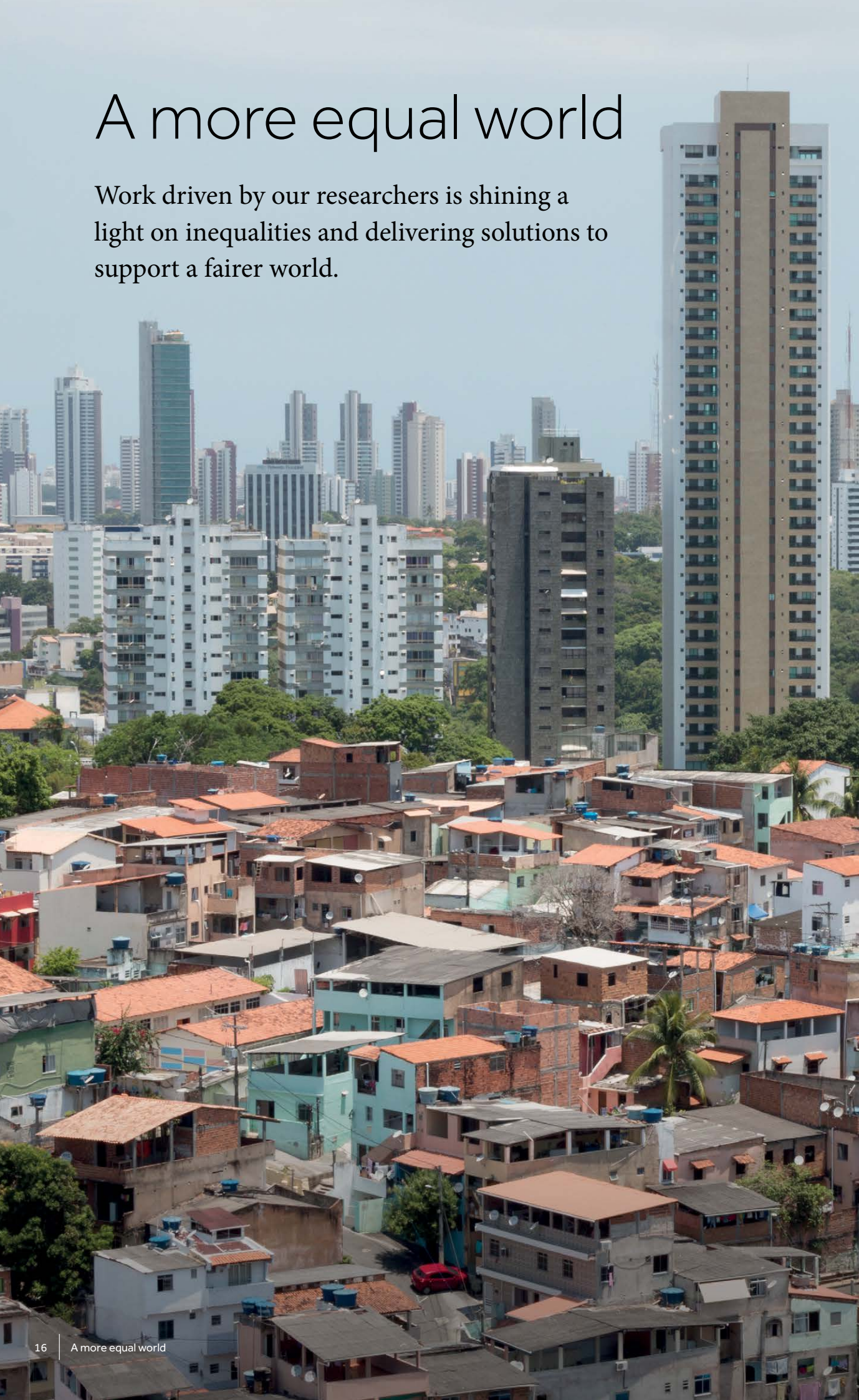
Raising awareness of cardiovascular disease

In East Java, Indonesia, Manchester’s Dr Gindo Tampubolon, Senior Lecturer at the Global Development Institute, and Professor of Molecular Cardiovascular Sciences, Delvac Oceandy, are working to increase the awareness of cardiovascular disease in low- and middle-income countries. In a two-year trial across eight villages, Tampubolon and Oceandy screened 12,000 people over the age of 40 for heart disease. After working with collaborators to design an algorithm to use within the

SMARThealth app, the blood samples were analysed in real time to identify those at normal, medium and high risk. More than half of participants were identified as high risk and could be prescribed lifestyle changes or drugs. This resulted in a 14.5% reduction in the number of people at high risk following the trial. The screening has since seen a wider roll-out in the Malang district and will be scaled up to reach 3 million people in the region.

A more equal world

Work driven by our researchers is shining a light on inequalities and delivering solutions to support a fairer world.



Driving healthcare reform

Led by professionals including Professor in Paediatric Oncology, Vaskar Saha, we're driving healthcare reform in India and helping to implement standardised treatment plans for cancers, including acute lymphoblastic leukaemia in children. Saha used his experience and knowledge about care for the condition, along with laboratory technology, to standardise treatments across multiple cancer centres.

Starting with the Tata Medical Centre (TMC) in Kolkata, Saha helped to increase the provision and capacity of cancer care in the region, along with enhancing the skills of the clinical workforce. Survival rates subsequently rose from 65% in 2014 to 80% in 2019. His approach was a catalyst for change in India, which now boasts a national network of cancer centres linked by modern practices and standardised treatment.



Supporting cultural strengthening and revitalisation

In collaboration with one of our cultural institutions, Manchester Museum, we welcomed a delegation from the Aboriginal Anindilyakwa community of Groote Eylandt for the formal return of 174 items of cultural heritage. Over a three-year period, the Museum worked with the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) and the Anindilyakwa Land Council to return items to their rightful home and inspire future generations.



Improving gender equity in education

In Brazil, India and the UK, we are promoting improved gender equity in academia. Through the Gender Advancement for Transforming Institutions (GATI) project, Dr Laura Richards is working with the University of Delhi to discuss gender equality initiatives, share relevant experiences and explore opportunities for collaboration. In Brazil, the parallel Women in Science scheme is progressing with hybrid workshops and virtual engagement, while closer to home, we are working with The British Council and AdvanceHE to help fellow institutions connect on gender equity initiatives.

Founded by then Manchester student and alumna Ann Njeri, the Elimisha Msichana Elimisha Jamii na

Astronomia (Swahili for 'educate a girl, educate the entire community with Astronomy') project looks to address gender disparity and inequality in education among girls in Kenya and Uganda. Through outreach; mentorship; scholarships; and science, technology, engineering and mathematics (STEM) workshop programmes, Njeri's aim is to ensure a 100% transition between primary and secondary education for schoolgirls in rural regions.

In four years, the project has reached more than 7,000 girls and their parents across 30 schools. It has also provided laboratory equipment and donated computers to a select number of schools to increase opportunities to learn.



Tackling complex issues in African cities

Funded by the UK's Foreign Commonwealth and Development Office (FCDO), the African Cities Research Consortium (ACRC) was established by our Global Development Institute. In collaboration with international partners, the ACRC tackles complex problems in some of Africa's fastest-growing urban areas. Working closely with local partners and NGOs over several years, the project integrates systems thinking with rigorous political analysis to help catalyse sustainable and inclusive urban development.



A more sustainable world

As the planet faces more climate challenges than ever before, it is the responsibility of leading institutions like our own to find innovative solutions to support the future health of our world.

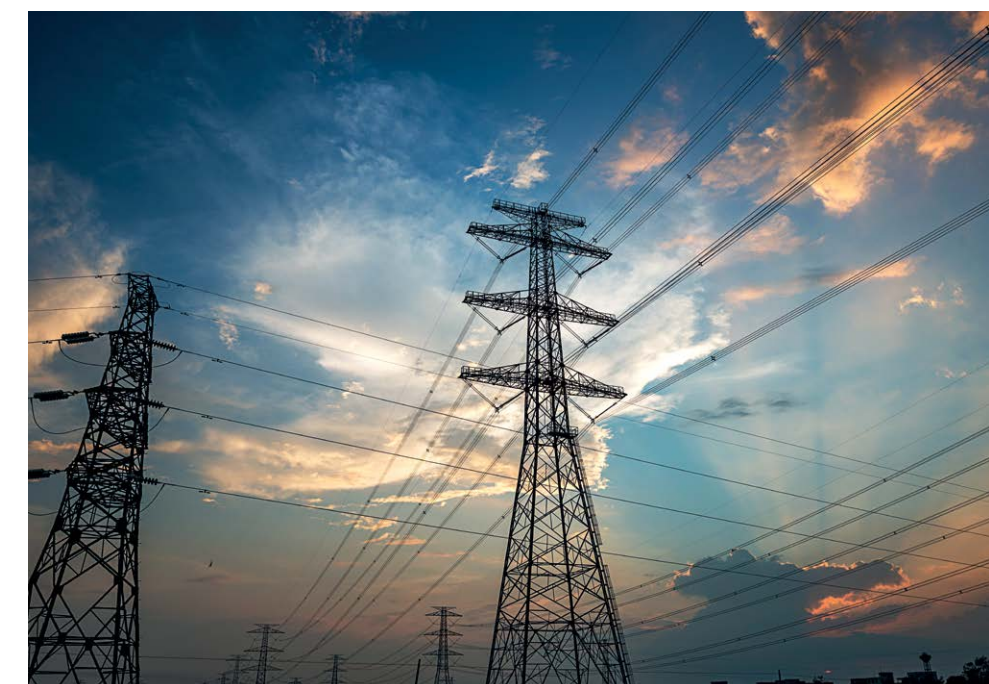


Combating wastewater pollution

Our researchers partnered with water treatment company Arvia Technology to develop an electrochemical process that dramatically reduces wastewater pollution levels and enables water recycling across several industries. Delivering on the UN's Sustainable Development Goal 6, the Arvia process has helped to reduce water demand and reliance on freshwater supplies, along with lowering pollutant levels from pesticides, pharmaceutical residues and natural hormones. The process is the first to use both capture and destruction methods to clean the wastewater. The solution has since been delivered to more than 25 companies in 11 countries.

Better network capabilities

In line with the UN's Sustainable Development Goal 7 – access to affordable, reliable, sustainable and modern energy for all – our researchers partnered with Electricity North West Limited (ENWL) to help it better manage its network, improve sustainability and save money for the company and customers. Researchers developed a matrix that can be used to model the relationship between network voltage and demand. They were then able to demonstrate how reducing the amount of energy used at peak times, creating less of a strain on the National Grid, could result in cost reductions for everyone. This has enabled ENWL to increase its customer base and connect more renewable energy sources to the network to help meet the UK government's 2050 carbon-reduction targets.



Improving plastic waste disposal

Plastic waste is one of the biggest global environmental challenges, with 2.5 million tonnes generated in the UK in 2021 and only 44% of this recycled. Challenges exist within the UK's waste recycling system, with 39 different bin collection processes across 391 local authorities. Rules, therefore, can change for one household to the next. Granted as part of the UK Research and Innovation's Industrial Strategy Fund, Manchester experts, in consortium with 17 industry and local authority partners, set up the 'One Bin to Rule Them All' project.

The project aims to improve compliance with recycling by developing one bin to hold all plastic-like items and improving recycling infrastructure to create more usable recycled plastics that can be fed back into a circular economy. It has since received £11 million in future funding to further the materials analysis work.

Reducing carbon emissions in transport and industry

In collaboration with our University, researchers at the Tyndall Centre for Climate Change Research worked alongside the Department for Business, Energy and Industrial Strategy (BEIS) and a team of modellers at the Netherlands Environmental Assessment Agency to devise ways to reduce carbon emissions in the transport and industry sectors. With these sectors continuing to grow and low-carbon technologies still in their infancy, Tyndall's Dr Maria Sharmina identified new ways to accelerate decarbonisation. By developing and applying a novel framework, Sharmina discovered that the greatest reductions came from cuts in carbon dioxide and energy intensity. Other contributing measures included less air travel, reduced transportation of fossil fuels and more locally-produced goods. Sharmina is now advising the UK government directly on its net zero strategy.



Innovation and discovery

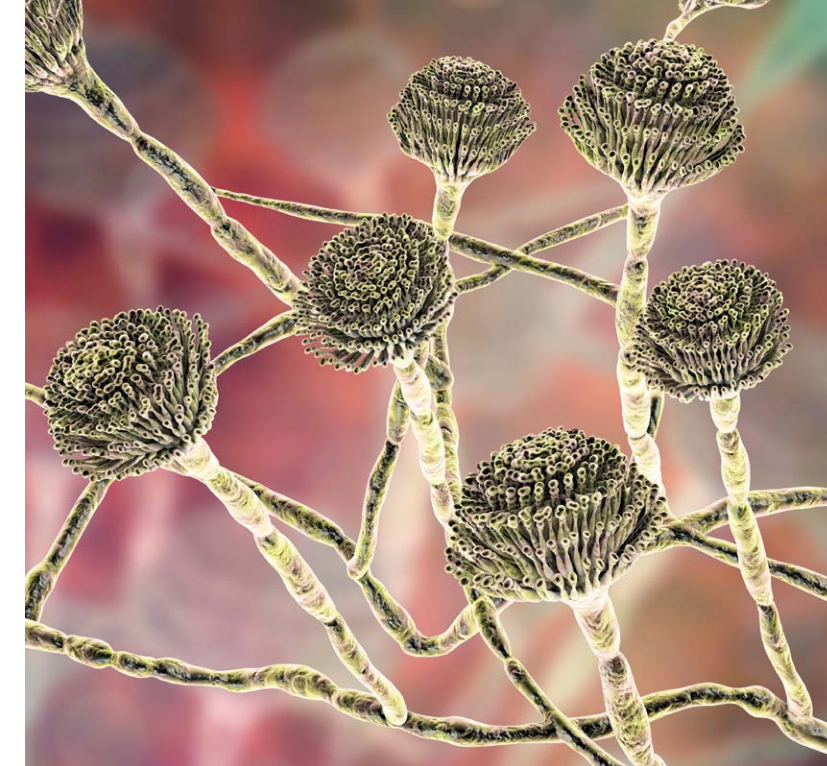
Our University has always been at the forefront of innovation, from the creation of the first stored-program computer, to building the world's largest steerable telescope, to the isolation of graphene.



Improving quality of life for millions

With more than 300 million people worldwide suffering from serious fungal infections and 2 million of these individuals dying each year as a result, our researchers set about changing the understanding and treatment of Aspergillus disease to improve patient quality of life and survival.

Through international collaboration and research, Aspergillus antigen and antibody tests are now listed as essential diagnostics by the World Health Organisation (WHO). The world's first frontline therapy for the disease has also been licensed, along with the creation of the world's first national clinical centre for fungal disease.



Preventing injury in the recycling sector

Discarded batteries can cause injury and disruption during the recycling process. Our experts, including Professor of Artificial Intelligence Hujun Yin, in partnership with Benson Components Ltd, have used AI technologies to develop a vision-based device to scan electrical junk and detect problem batteries, even in the most damaged equipment. The product is set to be scaled-up and made available globally to the recycling sector.

Investing in our communities

Through shared research and a knowledge exchange agenda, Creative Manchester's Beyond the Creative City network brings together international academics from across disciplines including economics, urban planning, geography, sociology, cultural policy and creative practice. Together, the network is identifying challenges, producing peer-reviewed research, policy engagement and creative digital outputs for places and communities that have been previously left behind by national policy and investment.

At the University's Productivity Institute, world-leading experts work directly with policymakers and businesses to better understand, measure and enable improvements in productivity across the UK, including living standards and wellbeing.



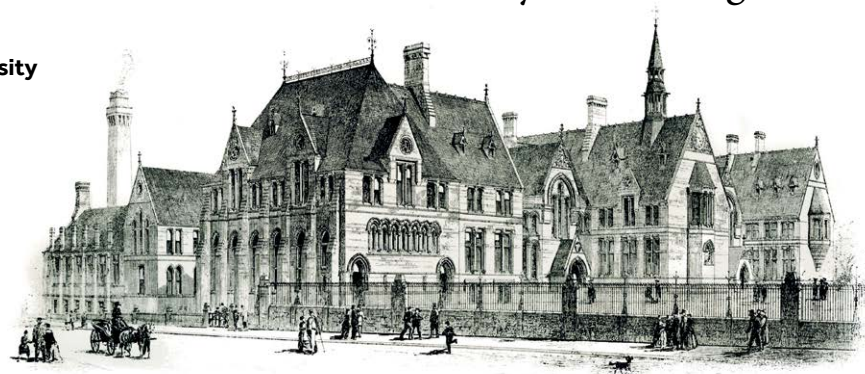
Image: 'Not Quite Light' by Simon Buckley.

A history of firsts

Founded in 1824, The University of Manchester is home to some of the world's greatest discoveries and pioneering ideas. In 2024 we celebrated our bicentenary, reflecting on 200 years of education, research and innovation, while looking forward to what our third century could bring.

1880 – The first civic university

Owens College becomes part of the Victoria University of Manchester, England's first civic university, built by and for the people of Manchester.



1903 – Suffragette movement

Emmeline Pankhurst founds the Women's Social and Political Union.



© National Portrait Gallery, London

1918 – Votes for women

University Law alumna Christabel Pankhurst campaigns for women's right to vote and helps get The Representation of the People Act passed.



1945 – Fifth Pan-African Congress

The fifth Pan-African Congress takes place in Manchester in October 1945. It was the first time since World War II that emerging African leaders, including those who became the first presidents of Kenya, Malawi and Ghana, took on the struggle to demand freedom from European colonialism.



1917 – Changing the world forever

Nobel Prize winner Ernest Rutherford creates the first artificially-induced nuclear reaction and, in turn, initiates the field of nuclear physics.



1948 – The birth of modern computing

The Manchester Small-Scale Experimental Machine, known as 'the Baby', becomes the world's first computer to successfully run a program stored electronically in its memory.

1948 – Britain's first Black professor

Sir William Arthur Lewis is appointed Chair of Manchester, making him the first Black professor in Britain. His work later wins him the Nobel Prize in Economics.



1950 – The beginnings of artificial intelligence

Based at the University, computer scientist Alan Turing creates The Turing Test, a method of determining whether a machine can demonstrate human intelligence.

1957 – Tracking the stars

Sirs Bernard Lovell and Charles Husband complete the Lovell Telescope at Jodrell Bank – the largest steerable dish radio telescope in the world at 76 metres.



2004 – The home of graphene

Sirs Andre Geim and Kostya Novoselov are the first to isolate the properties of graphene, a 2D material thinner than a human hair, yet 200 times stronger than steel.

2023 – Creating societal and environmental impact

The University ranks in the top ten for five years running in the *Times Higher Education* Impact Rankings, for its societal, environmental and governance impact.



The evolution of graphene at Manchester

In 2024, we mark 20 years since the isolation of wonder material, graphene. Researchers at The University of Manchester are pushing forward with innovative applications – showing the world its potential.

Back in 2004, scientists knew the one atom thick, two-dimensional crystal graphene existed, but no-one had worked out how to extract it from graphite until the experiments of Sirs Andre Geim and Kostya Novoselov's led to just that. Their breakthrough has since prompted the development of a whole family of 2D materials. These include hexagonal boron nitride and molybdenum disulphide, which, when combined with graphene, have the potential to create heterostructures or 'designer materials' only previously seen in science fiction.

Today at Manchester, more than 300 experts are dedicated to graphene and related 2D material research, across

a broad range of disciplines. The properties of graphene make it ideal for countless applications. It is stronger than steel, yet lightweight and flexible. It is electrically and thermally conductive but transparent, and it is one million times thinner than the diameter of a single human hair. It has the potential to change the way we make products across industries including transport, medicine, electronics and energy.

We provide opportunities for collaborative research programmes with our world-class academics, who are at the forefront of research in 2D materials. At our National Graphene Institute and the Graphene Engineering Innovation Centre we are also working with some of the world's biggest and most influential companies to make graphene ideas a reality.

Forming partnerships



Our University partners with leading institutions and businesses across the globe to enhance and propel research, share expertise and provide life-changing opportunities for students.

Strategic partnerships give us the opportunity to share the latest

research, exchange knowledge and discover solutions both at a local and international level. A shared student community, through joint programmes, funding and exchange, provides high-quality education while strengthening mobility and connections with industry, regional and national governments.

Through collaboration, we are co-creating solutions to the world's biggest challenges.



University of Manchester delegation visit to the University of Tokyo, April 2023



North American students from Spelman College, Vassar College and Xavier University visit The University of Manchester, October 2023



University of Manchester medicine students meeting with the Governor of Kisii County, His Excellency Simba Arati, July 2023

Shaping the future through research



We are not alone in our ambition to create a better world. We partner with leading institutions and businesses globally to advance our joint research and explore transformative solutions that cater to the growing complexities of the modern world.



The trilateral MMT alliance with the universities of Melbourne and Toronto brings together 187,000 students and 45,000 staff across three continents to promote vital knowledge exchange in areas including sustainable consumption, cultural industries, indigenous populations, digital health and cancer. Researchers have access to specialist facilities that support collaborative working, while students benefit from world-renowned teachers, innovative classrooms and leading exchange schemes.

The ongoing civic engagement between the cities of Osaka and Manchester is complemented by our strategic partnership with Osaka University, and facilitates increased research engagement in several areas. This includes environmental sustainability, advanced materials – such as in photonics, nano and quantum materials – and biotechnology. Overall, the partnership looks to strengthen the science and boost innovation in these key spaces.



We have a strategic partnership with Heidelberg University in Germany and annual research seed funding with universities including the KTH Royal Institute of Technology, Stockholm University, Tel Aviv University and the Chinese University of Hong Kong. We also conduct dual or joint award PhD programmes with Tsinghua University, University of Tokyo and the University of Melbourne.

Discovering the next change-makers



Through relationships with fellow leading institutions, we are helping to shape the world's future leaders. Our special relationship partnerships with US colleges, including Vassar, Spelman and Xavier University, create a collaborative environment that supports academic growth, mutual learning and meaningful connections. Manchester is supporting Faculty and student exchanges, joint research projects and the Global Classrooms initiative to enrich the educational experience for students on both sides of the Atlantic.

Within the Healthy China 2030 policy, it is recognised that China lacks community pharmacies. Our partnership with the China Pharmaceutical University is addressing the gap by enabling Chinese students to develop the skills necessary to work in clinical pharmacy through collaborative teaching and learning.

Student exchange is also part of our collaborations with Shanghai Jiao Tong University and Peking University

Health Science Centre. We have been awarded two China Scholarship Council Innovative Talent Platforms, which allow the exchange of PhD students and post-doctoral fellows between Manchester, Beijing and Shanghai within healthcare and life sciences.

We created joint doctoral programmes with both the Indian Institute of Science in Bengaluru and the Indian Institute of Technology, Kharagpur. In Bengaluru, we're building on research collaborations in graphene, atmospheric sciences, advanced manufacturing and artificial intelligence. In Kharagpur, we're bolstering work in environmental geochemistry, biomaterials and Industry 4.0. Our dual doctoral programme with Universidad de Chile focuses on electronic and electrical engineering.

Two Egyptian universities are collaborating with us to enhance medical training programmes and create a more sustainable workforce that has the skills and qualifications to work



internationally. At Mansoura University, Manchester has helped to expand its medical programme by adapting teaching and learning methods for the Egyptian system, while also making the course more attractive to overseas students. In a second partnership, we have established a joint award medical programme with Alexandria University, which offers a degree from both institutions. These collaborations also offer staff exchanges, giving educators the opportunity to explore new approaches to teaching.

Channelling innovation into business



Skin ageing and repair research from the University and Walgreen Boots Alliance (WBA) led to the development of No7 Future Renew, a world-first super peptide blend supporting the skin's natural repair process.

We're based in Manchester, but our partnerships are creating impact across the world. From working with local businesses to boost our regional ecosystem to collaborating with global conglomerates on transformative projects, we're at the forefront of positive change.



Professor Rahul Nair of the National Graphene Institute is partnering with the Carlsberg group to develop next-generation membranes for filtration and separation technology for the food and beverage sector. This is part of the Royal Academy of Engineering's Research Chair scheme, which promotes collaboration between academia and business to tackle engineering challenges. The project will explore how graphene and other 2D materials-based membranes can be used for healthy, sustainable and responsible plant-based food production.

Leading Indian steel manufacturer Tata Steel committed £10 million to a joint research and development initiative with the Henry Royce Institute. Through this centre for innovation in advanced materials, the partnership will focus on medical materials, 2D materials and second-life materials such as in reuse and recycling. It capitalises on Tata Steel's expertise in technology translation and commercialisation, supported by the Institute's strengths in science and innovation within advanced materials.

For more than 20 years, the University has collaborated with Walgreen Boots Alliance (WBA) to examine the characteristics of skin ageing and the role of the environment in accelerating the process. This includes testing the efficacy of anti-ageing technologies to inform the development of more effective interventions for consumers. The programme covers a broad range of dermatological research including clinical testing, basic biology, analytical science, pharmacy and regenerative medicine.

Since its initiation, the collaboration has filed seven patents and published 61 academic articles. The University was also successful in its 2023 bid for Prosperity Partnerships funding from the Biotechnology and Biological Sciences Research Council (BBSRC). Known as Project Spectrum, the multi-million pound partnership looks to redress a historical imbalance in the existing body of skin research, with darker skin tones underrepresented. It represents an exciting evolution of the collaboration, uniting national and international experts in skin biology, photobiology and gerontology.

Creating social and environmental impact



We were the first university in the UK to have social responsibility as one of our core goals.

Our commitment is exemplified through programmes including Researching the Impact of Attacks on Healthcare (RIAH). This global,

multi-institution, interdisciplinary programme is dedicated to improving understanding of the short- and long-term impact of attacks on healthcare in areas experiencing armed conflict. In 2022 alone, there were more than 1,900 incidents of threats and violence to health workers across



32 countries. This research is crucial in helping to improve the resilience of health programmes, enable effective mitigation measures and initiate long-term policy changes.

We're also partnering with global sustainable development consultancy, Arup, to drive cutting-edge research and create impactful change across engineering, mathematics, urban planning, social value and sustainability.

Find out more about our global work
uom.link/global

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