  
  
**University of Birmingham   
China Institute Annual Report 2021**

# **Contents**

2021 Year in Review

Case studies

Education

Culture and events

Media and digital communications

Contact

# **Welcome**

On behalf of the University of Birmingham’s China Institute, it gives me great pleasure to introduce our annual report covering the calendar year 2021. As during much of the previous year, 2021 was of course dominated by the COVID-19 pandemic, which has obviously had a profound effect on international travel and the functioning of the University and its staff. However, in spite of the difficult circumstances, we have seen a continuing high level of engagement with our Chinese partners in both education and research, and in fact have been able to initiate and develop several new partnerships. This level of activity is a testament to the dedication of our academic staff and all of those who work with the China Institute, including those staff who are based in our China Office in Guangzhou. The latter has been a particular advantage for the University, as it has made continued and regular dialogue with our partners possible when others have had to rely solely on video conferencing.

This report shares some of the education and research achievements from the year, amongst which a highlight was the graduation in July of our first cohort of students from the Jinan University-University of Birmingham Joint Institute. In a virtual ceremony featuring speeches by senior leaders from both institutions, including both the Vice Chancellor of the University of Birmingham, and the President of Jinan University, almost 100 students received their mathematics-based degrees.

Case studies in the report hopefully give a flavour of the breadth of our research engagements, which range from environmental protection and energy storage, to projects in the area of sports science, and digitalisation and Chinese regional development. Some notable examples illustrating the relevance and diversity of our research partnerships in China include the recently published study on air pollution involving over 150 UK and Chinese scientists, which has confirmed a significant improvement in the air quality in Beijing. A landmark publication describing spectacular fossil plants preserved within a volcanic ash fall in China shone new light on an evolutionary race 300 million years ago that eventually led to the dominance of the seed-bearing plants.

Although restrictions due to COVID-19 dominated 2021,   
the China Institute continued to reach out to a wide audience through a number of virtual events, including an online Lunar New Year concert, once again involving the tremendous support of our long-standing friend, the concert pianist Di Xiao, and our annual Li Siguang Lecture, which this year was presented by Professor Yan Zheng, who is based in SUSTech and is internationally recognised as a leader in the management of the effects of climate change on   
water resources.

Another highlight of the year was the successful launch, on the eve of COP26, of the World Alliance of Universities on Carbon Neutrality (WAUCN) which was jointly initiated by University of Birmingham and Southeast University in China. With 29 top-ranking universities and research institutions around the world as founding members, WAUCN aspires to pursuing innovation to deliver net zero, with a focus on seeking science, engineering and technological solutions for achieving carbon neutrality and climate change mitigation target.

So, our work has continued very effectively and at a pace with our many Chinese partners, and the future certainly holds in store many great discoveries and developments for the benefit of our societies. I am sure, though, that we all look forward to times when we can once again travel more freely and have those irreplaceable and invaluable face-to-face meetings that underpin the strength of our partnerships and friendships.

Professor Jon Frampton Deputy Pro-Vice-Chancellor (China) and Director of the University of Birmingham China Institute

# **Year in review**

All figures correct as of period 3 December - 10 December 2021

* 1,319 Twitter followers
* 29,506 Weibo followers (organic growth of ww14% over past 12 months)
* 21,967 WeChat followers (organic growth of 32% over past 12 months)
* 13,000 viewers of China Institute virtual events
* £1,915 million Advertising Value Equivalent (AVE)
* 6,468 Chinese Media Publications mentioning the University of Birmingham
* 5,756 Chinese students studying at the University of Birmingham (including transnational education)
* £786,000 External research income
* 2 major events

## **Case Studies**

**Shakespeare in Stratford and Nanjing**

Professor Michael Dobson, Director of the Shakespeare Institute; Professor of Shakespeare Studies

Although inconvenienced by the pandemic, the Shakespeare Centre, China – established in 2016 through collaborations between the University of Birmingham’s Shakespeare Institute, Nanjing University’s English department, and Phoenix Publishing and Media Group’s Yilin Press – embarked this autumn on its most ambitious event yet. On 29 and 30 October 2021, student performers and directors from universities all over China converged on Nanjing, where they participated in a series of workshops and training events with invited Chinese, British, and American directors.

Over the same weekend, academics from across  
China and from the Shakespeare Institute convened  
online to continue, appropriately enough, their joint exploration of Shakespeare and space. Both aspects of the event, both theatrical and scholarly, were supported by the Nanjing alumnus Xia Peng, a successful online educator and a passionate supporter of the work of the  
Shakespeare Centre.

Plans to follow up the Shakespearean performance workshops with a full-scale pan-Chinese competitive student Shakespeare festival, to find a winning group whose prize would be a visit  
to the Institute in Stratford, have had to be put on hold until COVID-19 travel restrictions ease, but all is in ready for whenever circumstances may permit the collaboration to enter this exciting new phase.

**Sustainable Development  
and Information Communication Technologies**

Professor John Bryson, Chair in Enterprise and Economic Geography, Birmingham Business School

This year, Yinghao Zhang, a PhD student from East China Normal University, joined the University of Birmingham as a visiting student for a year, funded by the China Scholarship Council. He graduated with a Masters degree from the University of the Chinese Academy of Sciences. At Birmingham, he is working with Professor John Bryson to continue his research on the internet, digitalisation and regional economic development, and pathway transformations. Rapid developments in information communication technologies (ICT) may promote sustainable development transforming regional economic development pathways, but there is a lack of systematic research on the differences between local economic development models and pathways impacted by ICT.

John and Yinghao’s research focuses on how regions combine existing network-like structures with a multi-scale agency approach to promote regional economic transformation in the context of rapid developments in ICT. The focus is on the macro-scale, but also on individual cities. This research will help to enhance understanding of the spatial patterns and impact mechanisms of ICT and the contributions they make to enabling local economic development, while also extending evolutionary economic geography theory.

This study is supported not only by the China Scholarship Council, but also by the National Social Science Foundation of China, and includes a number of important research projects that have focused on Shanghai. Yinghao’s arrival will facilitate further academic collaborations between the University of Birmingham and the School of Urban and Regional Sciences, East China Normal University, and the Centre for Modern Chinese City Studies.

**Vertebrate Palaeontology of China**

Fion Waisum Ma, PhD student in Earth Sciences (Palaeobiology)

Fion collaborated with Prof Lida Xing (邢立达) from China University of Geosciences (Beijing) to work on a dinosaur embryo discovered in southern China. It is one of the best preserved dinosaur embryo fossils ever reported and shows that oviraptorosaurs may have similar prehatching behaviour as living birds. This story was widely covered by UK, China and international media.

Fion was part of the international team led by Xuanyu Zhou (周炫宇), a former student of China University of Geosciences (Beijing), to describe a new pterosaur from the Jurassic of Liaoning Province. The new species Kunpengopterus antipollicatus (对握鲲鹏翼龙) represents the oldest record of an opposed thumb in the Earth’s history and the first time such feature is observed in pterosaurs. In collaboration with Beipiao Pterosaur Museum of China (中国北票翼龙博物馆), the team continues to study the vertebrate fossils from Liaoning.

Fion was also part of the team of a study led by Henan Natural History Museum (河南自然博物馆) in Zhengzhou, where they used CT scanning to study the partial jaw of a sauropod dinosaur from Henan Province. Projects on Henan sauropod fossils

are still on going.

In total, Fion published four papers in the last year in collaboration with Chinese universities and museums.

**Undergraduate, and Postgraduate Taught and Research Courses: Multi-Level Collaborations Between the School of Mathematics and Hust**

Dr Hui Li, Reader in Applied Mathematics, School of Mathematics

The collaboration between the School of Mathematics and Huazhong University of Science and Technology (HUST) started from an articulation programme established in 2012, then broadened to include a pre-master collaboration in 2016, and developed further to include an annual workshop between young scholars and PhD students in 2018. Our productive collaborations have continued to thrive over

the past 20 months through online meetings on Zoom and webinars, promoting our programmes and exchanging research.

The 1+1 pre-master programme provides students who do not have solid mathematical background with an opportunity to learn mathematics at HUST for one year then come to Birmingham the following year to study various PGT programmes including MSc Mathematical Finance, Financial Engineering and Mathematics, Operational Research, Statistics and Econometrics (MORSE). To date, 70 students have taken the pre-master path, and despite the pandemic, 15 students are currently studying the pre-master programme at HUST.

Our annual workshop and joint seminars for young scholars, including PGR and PhD students, is another exciting path for collaboration. Together with Professor Ouyang Hongbing from HUST, we were awarded £20,000 from HUST in 2018 for this project, and the most recent seminar was held in December 2020, lasting for two days. More than 30 master’s researchers, PhD students and scholars from HUST, the School of Mathematics and the Department of Economics at the University of Birmingham participated in the seminars, and 12 presented their research with follow-up discussions. The topics covered optimisation and applied statistics in asset pricing, cooperate finance, environment, energy, and economic development. We all look forward to the next joint seminars in the near future.

**Clean Cooling Technologies – From Materials to Systems**

Dr Binjian Nie, T-ERA Senior Research Fellow, Birmingham Centre for Energy Storage

Dr Boyang Zou, Senior Research Fellow, Birmingham Centre for Energy Storage

The University of Birmingham has been collaborating with Jiangsu Jinhe Energy Technology Co., Ltd. (Jinhe, China) and Kelvin Thermotech (Kelvin, UK) since December 2020 to develop novel cleaning cooling solutions based on cold thermal energy storage (CTES) technologies for applications in refrigerated warehouses, data centres, and telecommunication base stations. Thermal energy storage is one form of energy storage. In the cooling case, a material gains cold energy when decreasing its temperature, and loses it when increasing. The two-year project aims at developing phase change materials (PCM), PCM based modules/devices, and the integration of the devices to various applications. PCM are substances that absorb or release large amounts of so-called ‘latent’ heat when they go through a change in their physical state, i.e. from solid to liquid and vice versa.

Although we are less than a year into the project, the joint team from the University of Birmingham and Kelvin has completed composite PCM formulations for the three applications (Figure 1). A 1,000 tons per year production line has been set up by Jinhe to facilitate the fabrication of these materials at scale. The device- and system-level modelling has showed a 20-35% energy cost reduction using the CTES technology, providing strong evidence for the establishment of a commercial trial in a refrigerated warehouse in China (Figure 2). More importantly, the findings so far suggest the integration of CTES technology with these applications to be both technically and commercially feasible, providing an avenue for future net-zero cooling solutions using intermittent renewable energy. The UoB team is led by Dr Binjian Nie (Principal Investigator) and Dr Boyang Zou (Co-Investigator).

**Multi-Level Collaborations with our key Partner Huazhong University of Science and Technology**

Nina Morris, China Institute Officer

In December the University of Birmingham signed a number of agreements with *Huazhong University of Science and Technology* (HUST) including a ‘Key Partner’ agreement, and MoUs in Nursing and Dentistry. This event was marked with a hybrid signing ceremony, in which assembled University of Birmingham staff, led by the Vice Chancellor and Principal, Professor Sir David Eastwood, joined leaders from HUST through a video link from their boardroom in Wuhan.

During this event, HUST also conferred the award of Guest Professor on Professor Chris Tselepis, Head of the School of Biomedical Sciences at the University of Birmingham, reflecting his leading role in shaping the internationalisation of the biomedical sciences degree programmes at Birmingham as well as his work with HUST colleagues in establishing joint education and exchange opportunities. This event also provided the opportunity to discuss wider partnership developments including TNE opportunities.

**University of Birmingham Hong Kong Foundation**

Craig Edwards, Senior Development Executive

University of Birmingham Hong Kong Foundation

The Board of Directors of the University of Birmingham Hong Kong Foundation made their first funding awards to the University this year. The Foundation provides opportunities for the exchange of knowledge, students and researchers between Birmingham and Hong Kong.

Geoffrey Ma Scholarship Programme will allow the best and the brightest students from Hong Kong to follow in former Chief Justice Geoffrey Ma’s footsteps to Birmingham. Geoffrey Ma is the Foundation’s first Honorary President, with Foundation funded scholarships established in recognition of his many achievements and his contribution to public life.

Changing Childhoods in a Changing World

In partnership with the Educational University of Hong Kong this ground-breaking research aims to understand how children (4-5) learn how to learn, bringing together classroom observations with measurements of their biochemistry. It will give insight into how learning activities stimulate biological responses related to emotional wellbeing and cognitive learning.

In collaboration with HKU this project aims to sample microplastics gathered from the 6 major rivers of Hong Kong and the Pearl River Delta.This will be the most comprehensive mapping ever undertaken, with data then used to model the environmental impact and how it can be averted.

For more information see: https://www.birmingham.ac.uk/alumni/ giving/hong-kong-foundation/index.aspx

**Education Collaboration with Shanghai University of Sport**

Dr Matt Bridge, Senior Lecturer in Coaching & Applied Sports Science, Deputy Head of School

The School of Sport, Exercise and Rehabilitation Sciences has signed an entry agreement with the Shanghai University of Sport (SUS), that will provide MSc opportunities for SUS students at Birmingham. Working together, we have designed MSc programmes that will give SUS students the opportunity to come and study at Birmingham’s globally high ranking school and develop advanced skills in Physiotherapy and Sports Science. This partnership between China’s number one ranked university for Sports Science, and an area of particular strength in Birmingham, will also extend to visiting PhD Scholars and with the opportunity for shared PhD programmes in future.

This partnership builds upon existing collaborations, an example of which is Xiao Liang’s successful defence of her PhD thesis this summer. Xiao was co-supervised by Dr Shushu Chen and Dr Ian Boardley from Birmingham and Professor Dongfeng Liu from SUS. Dr Liang’s research examined the impact of the Shanghai Formula One (F1) Grand Prix on local small and medium-sizes enterprises’ social and economic development. She found that there is a moderate effect of the Shanghai F1 on local SME development evidenced both on economic and social aspects. Sports and Automobile SMEs reported growth in turnover and profits, improved corporate and brand image, and increased opportunities for cooperating with other sectors because of the Shanghai hosting of F1. We expect this partnership  
to grow in strength with the many research and education interests shared between the University of Birmingham and SUS.

**Collaboration with Nankai University via the Joint Research Institute on Green Economy and Sustainable Development**

Professor Iseult Lynch, Chair of Environmental Nanosciences and Co-Director of the University of Birmingham-Nankai University Joint Research Institute on Green Economy and Sustainable Development

Despite not being able to hold face-to-face meetings, collaboration opportunities abounded as the two universities adapted to online and virtual working. For example, the College of Environmental Science and Engineering at Nankai University organised an Online Academic Salon on Environmental Health, and as part of the Academic Salon on 10th December, 2020, Professor Iseult Lynch gave a lecture on her work on the interactions of nanomaterials with biomolecules in the environment and how this alters their surface properties and drives their recognition by living organisms in the environment.

A collaborative paper co-authored by Jingshu Wang and Professor Jinhui Jeanne Huang from Nankai University and Iseult Lynch from the University of Birmingham explored the seasonal and short-term variations of (pathogenic) bacterial diversity on road deposited sediments including tyre and break-wear particles, which are a type of microplastic. The paper, published in Environmental Research, found that seasonality showed a higher association with the bacterial community diversity than land use or particle size in urban areas. Urbanisation increased the bacterial community diversity, while potentially pathogenic bacteria were more abundant in suburban areas, on larger road dust particles (>75 μm) and in spring. These findings provide important directions for future research on the assembly process of bacterial communities on road dust particles and other microplastics.

As part of our contribution to the United Nations Climate Change Conference (COP26) in Glasgow in November 2021, Professors Iseult Lynch and David Dickinson (School of Economics) from the University of Birmingham, and Professors Jiadong Tong (Nankai University School of Economics) and Jinhui Jeanne Huang (Nankai University College of Environmental Science and Engineering) wrote  
an article presenting the University of Birmingham-Nankai University Joint Research Institute for Green Economy and Sustainable Development, and our research on ‘The business of environmental protection’. Our research vision is to achieve continued economic prosperity within the sustainable resources of the planet, with a clear focus on design of pollution solutions that are cheap, can be retrofitted easily onto existing industrial plants, and result in demonstrable improvements to environmental quality underpinned by solid environmental and industrial economic principles, leading to a framework for green economic growth. Delivering this requires innovative integration of technological, regulatory, and financial incentives for businesses into economic and environmental policy, and significant lifestyle changes for individuals to value environmental protection.

**Increased Collaboration in Data Science for the Life Science with Chinese Partners**

Professor Jean-Baptiste Cazier, Chair of Bioinformatics, Director of the Centre for Computational Biology, Co-Director of the WSCM/WCH-Birmingham Joint Research Institute, Director of the Joint Research Centre for Data Science in Biomedical Research with Southeast University

Professor Georgios Gkoutos, Chair of Clinical Bioinformatics, Associate Director of the Health Data Research UK Institute, Co-Director of the WSCM/ WCH-Birmingham Joint Research Institute

The three topics of Data Science and AI, Health, and Environment are simultaneously taking a prominent role in China. In combination, these subjects are perfectly aligned with the Centre for Computational Biology (CCB), which therefore continues to be ideally placed to be a central point for collaboration for the University of Birmingham in China, especially in relation to Health.

In the past year, we have consolidated and expanded our engagement with several partners across China. Collaboration with our long-standing collaborators at the Born in Guangzhou Cohorts Study has led to publication on gestational diabetes.

As part of the WSCM/WCH-Birmingham Joint Research Institute for Health and Biomedical Informatics with West China Hospital, Chengdu, two PhD students have completed their 18 months visit of the University of Birmingham. Beyond their training in Data Sciences applied to the Life Sciences in the CCB, this visit led not only to several publications in both immunology and cardiovascular diseases, but also increased links between the institutions upon their return to China.

As part of the Joint Research Centre for data science in biomedical research with Southeast University (SEU), Nanjing, we are delivering a series of masterclasses in Bioinformatics covering a wide range of subjects to prepare for a joint master’s programme. Furthermore, SEU and the University of Birmingham are together finalising the establishment of the Nanjing Brain & Life Science Research Institute. Not only will it enable extended collaboration into the clinical setting, such as with the First Affiliated Hospital of Nanjing Medical University, it is also an opportunity to develop research and cooperation in Artificial Intelligence.

A similar effort to develop collaborations in Data Science, AI, and Mathematics is currently being developed with Southern University of Science and Technology  
(SUSTech), Shenzhen.

**Education**

**Jinan University – University of Birmingham Joint Institute Celebrates First Graduating Cohort**

Rachel Du Croz – Transnational Education Officer, College of Engineering and Physical Sciences

The Jinan University – University of Birmingham Joint Institute (J-BJI) celebrated the incredible success of its first graduating class in July 2021. J-BJI first opened in 2017, and this inaugural class have been the trail blazers of one of Birmingham’s most important collaborative projects in China. Students completed dual degrees in Mathematics with Applied Mathematics, Information Computing Science, Economics,or Economic Statistics. With 87 students in our graduating cohort, and the majority of students receiving a First-Class degree, the advantages of both international and local teaching methods are clearly demonstrated.

As well as coming to study in Birmingham on subjects including Mathematics and Health Economics, destinations for our J-BJI alumni also include Columbia University, the University of Cambridge, and the University of Science and Technology in China. The COVID-19 pandemic meant that a formal gathering was not possible, but both JNU and the University of Birmingham organised a celebratory online degree ceremony to commemorate and honour the students’ hard work over their four years. Student Representative Zixin Li, alumna of BSc Applied Mathematics with Economics, in her valedictory address said, ‘Every obstacle I have overcome in the university has become the courage I need to face the challenges of the future. Thanks to these four years, I have become a more confident and determined person’.

Bimodal delivery of modules has continued this year, providing students with high quality lecture recordings mixed with online live sessions to help them with their academic studies. A wide and varied programme of career opportunity talks has also been a key development area to provide our students with the best possibilities beyond their studies.

**Entry Agreements from Partner Institutions**

We have a significant number of entry and articulation agreements through a network of partnerships, working closely with over 40 high-quality institutions, which in 2021 has enabled over 140 undergraduate and postgraduate taught students to study on University of Birmingham programmes through bespoke arrangements with their Chinese institutions, progressing onto programmes at both our Edgbaston and Dubai campuses via these routes. In addition to these agreements, we also welcome students from our partnerships and beyond onto student exchange and study abroad programmes. This year, we have been delighted to welcome students through these partnerships into areas as diverse as Health Economics and Health Policy, English-Chinese Interpreting with Translation, Environmental Sciences, and Philosophy, Religion and Ethics, as well as more traditional disciplines such as Engineering, Mathematics, and Business.

## **Chinese students at the University of Birmingham**

Every year, a large number of Chinese students choose to join us in Birmingham. In November 2021, over 4,700 Chinese students were studying at our Edgbaston campus for both undergraduate and postgraduate qualifications, and 827 were studying at our Jinan University – University of Birmingham Joint Institute. 142 Chinese students were studying at our Dubai campus, with 91 studying on programmes we deliver at the Singapore Institute of Management (SIM).

## **Culture and Events**

## **New Year Concert**

Each year we celebrate the Lunar New Year with a celebratory concert, and although the COVID-19 pandemic meant that in 2021 we were not able to host our traditional live event to an auditorium full of people, we were still able to celebrate virtually with our friends around the world.

Our concert to celebrate the Year of the Metal Ox was pre- recorded in COVID-19-safe conditions, bringing together lead performer, world-class pianist Di Xiao, who was joined by renowned cellist Jiaxin Lloyd Webber and outstanding singer- songwriter Tazmin Barnes to celebrate the new year with a mix of Chinese and Western pieces, including Sinding’s Rustle of Spring, Debussy’s Clair de Lune, traditional Chinese pieces and original compositions, and finishing with an ensemble performance of Jasmin Flower – Mo Li Hua.

The concert was then streamed on YouTube, Facebook, and WeChat, reaching an audience of over 10,000 – far in excess of any of our previous concerts – and allowing us to reach a global audience like never before!

## **Li Siguang Lecture**

One of our most famous Chinese alumni is the celebrated academic Li Siguang, who studied in the University’s School of Mining during the early part of the 20th century.  
He received his BSc, MSc, and PhD from the University of Birmingham, based on his landmark research into the geology of China and a resulting definitive book on the subject. Li Siguang progressed to many prestigious positions including academician and Vice-President of the Chinese Academy of Sciences, Minister for Geology, and President of the Chinese Society for Science and Technology.

We honour his legacy and connection to the University of Birmingham with an annual lecture, which each year is based in a different academic discipline and is designed to engage with a broad range of stakeholders around the world. This year we were delighted that Professor Yan Zheng, Chair Professor, School of Environmental Science and Engineering, Southern University of Science and Technology (SUSTech), joined us to deliver the lecture entitled ‘Enhancing Groundwater Sustainability for Climate Resilience’. The lecture was timed to coincide with the start of COP26, given the importance of the topic to the themes being explored in this global climate conference. The lecture was followed by a panel discussion chaired by Professor Iseult Lynch - Professor of Environmental Nanosciences. Professor Zheng was also joined on the panel by Professor Dr Stefan Krause - Professor of Ecohydrology and Biogeochemistry, Dr Shirley Ye - Lecturer in Asian History and Dr Mike Jones - Water Resources Modelling Lead, Thames Water.

The lecture and subsequent panel discussion was streamed on YouTube, Facebook and WeChat, reaching a global audience of over 3,000.

## **Media and Digital Communications**

All figures correct as of period 3 December - 10 December 2021

We promote our work in China through a variety of channels, including official Chinese social media platforms, WeChat and Weibo, as well as Western-focused social media such as Twitter and LinkedIn. We also work closely with partner institutions in China to engage with Chinese media and raise the profile of our education and research collaborations through print, online and broadcast coverage.

The University of Birmingham also engages with Chinese students, staff, and stakeholders based in China and in the UK through its official WeChat and Weibo accounts. These two accounts have 21,967 and 29,506 followers respectively (as of 3 December 2021), and these numbers continue to grow. Weibo and WeChat stories that received the most engagements (reposts, comments, likes for Weibo and views for WeChat), have focused on a range of disparate topics. Study arrangements stories were the most popular across both platforms, reflecting concerns regarding the pandemic. Other high performing stories included a feature on our research around decarbonising heat, new buildings and facilities on campus, and graduation stories. As an example, the two most-viewed articles on WeChat over the last 12 months focused on September entry arrangements and return to campus arrangements and were viewed over 14,000 times and 13, 000 times, respectively.

In terms of international media coverage, over the course of 2021, there were 6,468 articles published in Chinese media which referenced the University of Birmingham, and an Advertising Value Equivalent of £1.9 million.

## **Contact**

For more information about the China Institute, or for further details on any of the projects and engagements referenced in this document, please contact Nina Morris, China Institute Officer: uobchina@contacts.bham.ac.uk

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