UNIVERSITY OF OXFORD

OSCAR

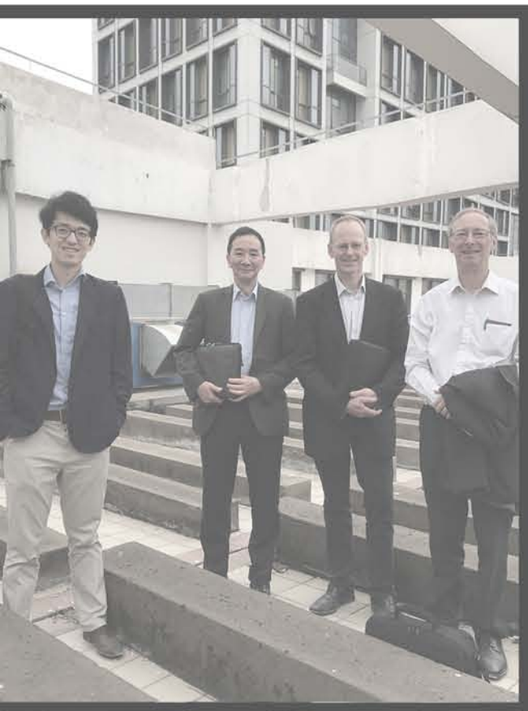
May **2018**

NEWSLETTER 010

牛津大学高等研究院（苏州）

OXFORD SUZHOU CENTRE FOR ADVANCED RESEARCH

oscar.web.ox.ac.uk



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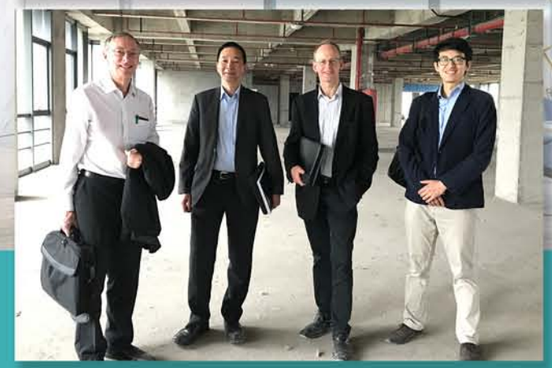
Delegation of Suzhou Industrial Park Officials Visits Oxford to Establish Collaboration

In the middle of May 2018, a delegation of five officials from the Suzhou Industrial Park visited the University of Oxford under the leadership of Wu Hong, Deputy Secretary of the Working Committee. The two sides held in-depth discussions on Sino-British international exchanges around scientific research and innovation.

Experts of the University of Oxford warmly received the Chinese guests and introduced in detail the benefits that Britain can offer. With the improvement of Sino-British cooperation in innovation in recent years, the British side hoped to establish a long-term and steady cooperative relationship with its Chinese partners to promote international exchanges and collaboration.

Zhanfeng Cui (Fellow of the Royal Academy of Engineering, Donald Pollock Professor of the University of Oxford and Director of OSCAR), Adam Workman (Head of Investments & New Ventures at Oxford University Innovation Limited(OUI)), Simon Gray (Head of Marketing), Brendan Ludden (Head of Licensing and Ventures, Physical Sciences) and Zhaoxuan Chen (General Manager of OUI Suzhou Centre) held in-depth discussions with the Chinese guests on the characteristics and advantages of their respective fields.

The delegation not only visited relevant departments of the University of Oxford, but also received a warm welcome and reception from the UK headquarters of the China-Britain Business Council (CBBC). During their visit to the CBBC, Nathalie Cachet Gaujard (Jiaxi Gu), Head of Innovative Education, received the Chinese guests. The two sides discussed their respective strengths and resources, with a view to deepen their cooperation on innovation, and strengthening the link with international innovation resources to help deliver their cooperation step by step.



Principal Investigators Visit OSCAR and Potential Collaborators in Suzhou

From 20 to 24 May, Principal Investigators (PIs) from the University of Oxford visited OSCAR to develop local collaborations and to meet with equipment suppliers.

Professor Mark Moloney, Professor Jeremy Robertson, Professor Luet Wong and Dr. Yang Cao from the University of Oxford's Department of Chemistry visited OSCAR.

They surveyed each floor of the OSCAR building, focussing on the design and layout of the 8th floor, which will house research in analytical chemistry, microbiology, and materials science. They held meetings with equipment supplier to discuss procurement matters.
Then they visited NUSRI and held a meeting with Dr. Xianning Xie (Associate Director (Research) of NUSRI) which focused on equipment and facilities for the chemistry lab, local equipment suppliers, and the processes for obtaining, storing and disposing of hazardous chemicals in accordance with Chinese regulations.

During their visit to Suzhou Institute of Nano-Tech and Nano-Bionics(SINANO), the renting of lab space and other relevant issues were discussed. They also visited their local collaborators in Soochow University and Xi'an Jiaotong-Liverpool University (XJTLU).

Principal Investigator Prof. David Clifton's Visit to China

On 21 May, 2018, an agreement was signed between the George Institute for Global Health (TGI China) and the Computational Health Informatics (CHI) Laboratory of the Institute of Biomedical Engineering at the University of Oxford. On behalf of the respective parties, Prof. Craig Anderson, Executive Director of TGI China and Prof. David Clifton, leader of the CHI lab, signed the agreement to acknowledge the importance of future cooperation in AI health research. Dr. Yang Yang and Dr. Tingting Zhu, both senior researchers in CHI lab, and Dr. Maoyi Tian, Head of Digital Health of TGI China, attended the signing ceremony.

Prof. Anderson initiated the meeting by providing an overview of current projects and emphasized TGI China's experience and strategic positioning in digital health. Prof. Clifton provided an update on the University of Oxford's digital health projects and introduced the recently-established Oxford Suzhou Centre for Advanced Research (OSCAR). He said, "As a multidisciplinary research, innovation and technology centre, OSCAR aims to cooperate with domestic universities and research institutions, and focuses on research challenges and technologies that capitalize on our research strengths: AI for Health is one of our priorities." Prof. Anderson commented that this new collaborative partnership could "propel the development of high-quality, patient-centred, healthcare that is broadly applicable to people across the globe."

Prof. Clifton, Dr. Yang, and Dr. Zhu then accompanied by Mr. Xuefeng Cui, CEO of UniNova (Tianjin) Co., visited the "top-tier" Tianjin Hospital. Participants at the panel discussion included the Dean, Prof. Ximo Wang; principals of the Departments of Information Technology, Emergency, and Medical Education; and representatives of the School of Microelectronics of Tianjin University and of Tianjin Yufeng Finance Co.

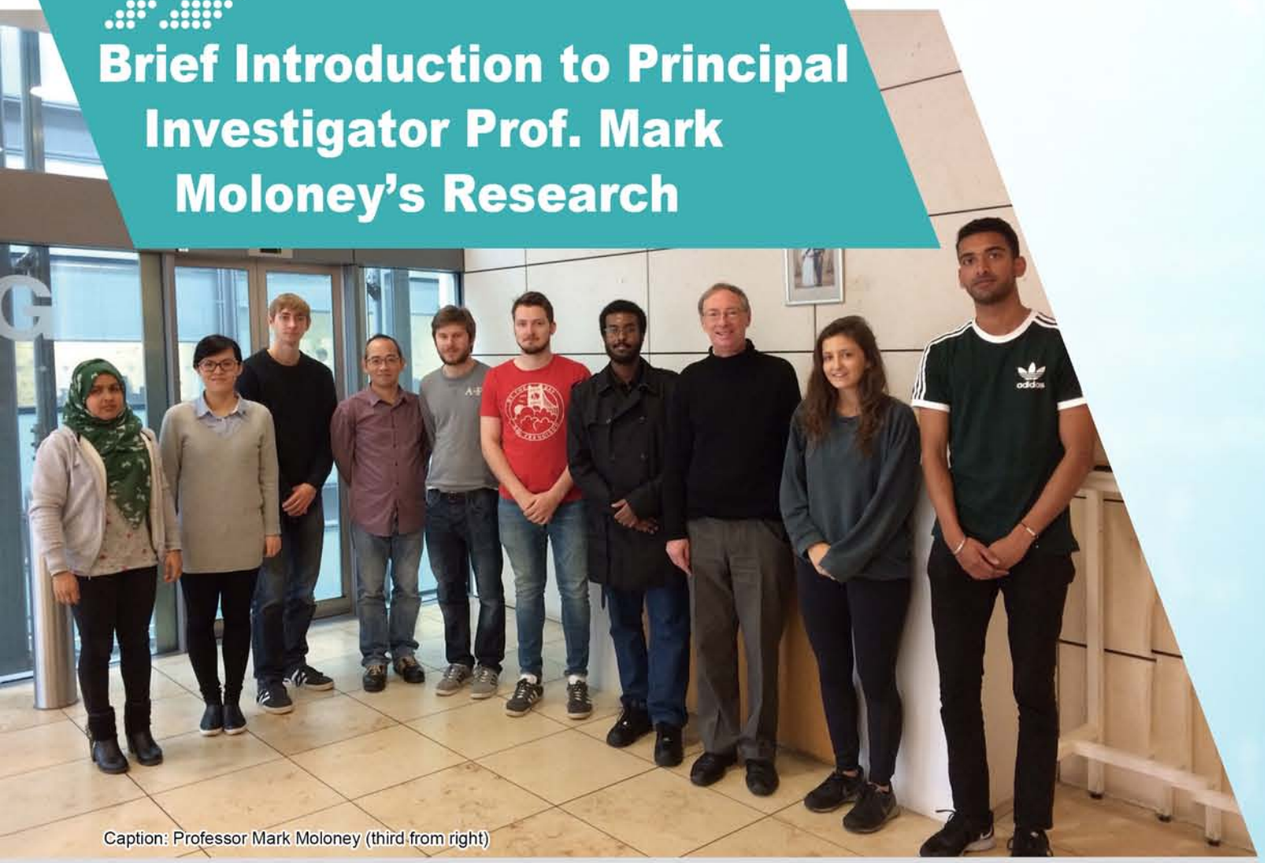
Prof. Clifton firstly gave a keynote speech on AI in Healthcare, and representatives from all parties actively participated in the discussion. Dean Wang expressed appreciation for the large-scale development of AI technology in the UK medical industry, and put forward constructive suggestions on the smooth introduction of AI technology in China. After the meeting, Prof. Clifton and the staff of the hospital's Department of Information Technology conducted in-depth exchanges on AI healthcare technology.

Prof. Clifton, Dr. Yang, and Dr. Zhu then visited the "China-UK Medical and Healthcare Innovation Park" (CUIP) operated by UniNova. CEO Xuefeng Cui explained the operation model of CUIP and showed guests around the public technology platform of Binhai New District, including its cell processing platform, the medical equipment research & development platform, cell detection public incubation platform, etc.

Afterwards, the two sides conducted in-depth discussions on potential cooperation, aimed at combining the scientific research strengths of the University of Oxford and the technological transfer and market channels of UniNova to create intelligent medical products. At present, the CUIP has successfully incubated Metrotech (Tianjin) Medical Technology Co., which introduced technology from a Scottish university; conducted secondary research & development suitable for China's healthcare system, and successfully launched a novel test for bowel disease.

Other visits for the CHI lab team included various hospitals in Shanghai, Suzhou, and Guangzhou, all aimed at identifying key collaborators for OSCAR research programmes.

Brief Introduction to Principal Investigator Prof. Mark Moloney's Research



Caption: Professor Mark Moloney (third from right)

Professor Mark Moloney is an organic chemist who specialises in the synthesis of new antibiotics and polymers. His primary interest is to use naturally occurring chemical systems to provide information for the design of new chemical structures with enhanced properties. A good example of his approach is shown from his work in the area of novel antibiotics; by analysing the structures of naturally occurring chemical compounds, he has been able to identify common structural elements which when prepared and then further modified in the laboratory, have shown significant promise as therapeutically active systems. By preparing a large number of chemical analogues and carefully analysing their activity, he has built up a profile of what structural elements lead to strong antibiotic activity, and this has been used to design new systems for further evaluation. It is this close coupling of structural and activity analysis which has been crucial for the success of this work. This work is currently in the process of being commercialised with a start-up (Oxford Antibiotic Group) which began in 2017 with the intention of bringing to the market the first novel antibacterial drug in more than two decades. This work is well advanced, and lead systems have been identified and pre-clinical evaluation is in hand.

In addition to this drug discovery programme, Professor Moloney has developed a wholly novel approach for the modification of the surface of materials, to introduce new properties. This is important because it permits the introduction of new properties onto polymers without changing their bulk characteristics and therefore avoids cost to develop wholly new polymer systems from scratch with the required properties. As a result, old polymers can be re-purposed for new applications by a simple adjustment of their chemical properties. The technique uses a heat- or light-activated chemical treatment, which may be applied by spraying, dipping, or drawdown- or Mayer-bar treatment. The chemical treatment itself is simple and easy to execute, and can be used to introduce colour, fluorescent, and photochromic properties, as well as biocidal, adhesion and biocompatibilising properties. There are possible applications in many sectors, and Oxford Advance Surfaces was created in 2006 for the purpose of commercializing this technology; current sectors of interest include energy (battery technology), manufacturing (automotive and transport) and sporting goods. One particular area of expertise is adhesion, especially in high value laminate and composite materials or relevance to the energy sector.

Aside from the obvious technical difficulties which inevitably arise in this type of work, one of the critical challenges is convincing potential collaborators and /or funders that the programme is worth being involved with and that the risk/reward ratio is acceptable. In the area of early technology development, this is a very difficult call to make, since what makes a good technology is not always obvious during the development stage, and different potential collaborators often assess the potential outcomes very differently. Professor Mark Moloney's experience in developing these researches has been that chance meeting events which come about often prove to be critical. In such interdisciplinary areas, it is not possible to have personal contacts which cover all aspects of the technical and commercial which are needed for success, and therefore the ability to talk and interact productively with different disciplines and experts is essential, to find areas of common ground and interest. In his case, this has involved talking with other chemists, but also critically engineers, materials scientists, physicists, along with commercial, legal, patent and technology transfer professionals, all of whom use different technical language – often for the same concept. Productive dialogue across these barriers, which often include not only technical barriers, but also different languages, is routinely required in order to explain and ultimately sell our concepts.

Aside from this interest in the application of organic chemistry to commercially relevant areas, Professor Mark Moloney also has a strong interest in chemical education, and in particular the development of understanding of organic chemistry, not just for organic chemists but also for experts in other disciplines. He has written several textbooks which aim to impart critical thinking skills and strategies for students which show how to go about thinking in organic chemistry.

Progress of OSCAR's Fit-out and Construction in May

Tendering process:

Fit-out construction is now undergoing the process of government regulated public tendering, which includes the following 6 sections:

Section 1. Construction engineering supervision (Stage 4 completed)

Section 2. Non-lab space construction (Stage 4 completed)

Section 3. Lab space construction (entering Stage 1)

Section 4. Air-conditioning construction (Stage 4 completed)

Section 5. IT construction (to be announced by middle June)

Section 6. Exhibition construction (to be announced by the end of June)

On-site construction:

The OSCAR building's Environment Impact Assessment was approved by the SIP Environmental Protection Bureau on 16 May (a prerequisite for on-site construction work permission from the Government). On-site preparations for non-lab space started at the end of May, with temporary office space and material storage rooms set up in the OSCAR building.

OSCAR Starts Recruiting Postdoctoral Research Scientists


(OSCAR Building in the Suzhou Nanotech National University Science Park)

The Oxford Suzhou Centre for Advanced Research (OSCAR) is the University of Oxford's first overseas centre for advanced physical and engineering science research, primarily expanding on activities from across the University's Mathematical, Physical and Life Sciences Division. OSCAR is located within the Suzhou Industrial Park (SIP), in the historical city of Suzhou, approximately 60km west of Shanghai.

Research programmes at OSCAR are led by established Professors from the University of Oxford and will initially focus on research in the following themes:

Biomedical Engineering and Healthcare
Environment and Biotechnology
Nanotechnology and Functional Materials

Following the completion of a state-of-art research building, OSCAR is recruiting its first wave of researchers. 36 research posts are available across three different levels:

Senior Research Scientists – experienced researchers who can work independently and can help the Oxford-based PIs to supervise the research group in China
Research Scientists – postdoctoral researchers who have recently completed a PhD in a relevant field
Research Technicians – with Masters-level training or equivalent

Researchers will be employed by OSCAR in Suzhou, China, but are expected to spend some time at the University of Oxford, UK, to integrate with the research groups of the OSCAR PIs. OSCAR offers internationally competitive salaries and the positions are for three years in the first instance, with the possibility of extension.

Detailed job descriptions, application procedures and deadlines can be found on the OSCAR website: https://oscar.web.ox.ac.uk/.
For informal enquiries please contact the Recruitment Office of Oxford Suzhou Centre for Advanced Research
Email: info@oxford-oscar.cn

(Scenery of Suzhou Industrial Park, Jiangsu, China)

Neighbours of OSCAR

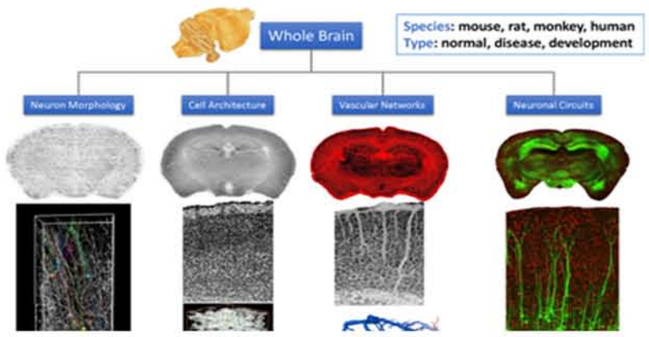
Institute of Brainmatics

The organization of "Suzhou Institute for Brainmatics (Huazhong University of Science and Technology)" was initiated by the Suzhou Municipal Government, Suzhou Industrial Park Administrative Committee, Huazhong University of Science and Technology as well as Jiangsu Industrial Technology Research Institute in October 2016, with Dr Qingming Luo as Director.

The HUST-Suzhou Institute for Brainmatics aims to develop the world's leading Brain-Spatial Information Science (brainmatics) techniques for brain cartography, focusing on the study of the brain-wide connectome atlas at the mesoscale, and to aid the study of brain disease and artificial intelligence. Taking the Micro-Optical Sectioning Tomography (MOST) serial techniques as the core, and employing high-resolution, high-throughput and large-detection-area 3D micro-optical imaging techniques, the institute will devote itself to establishing a high-resolution mammalian brain atlas for the fine morphology and connectivities of neurons, glia, vasculature, and other complex structures in the whole brain. The institute will also provide open services for general educational and scientific research institutions as well as for industrial organizations.

Brainmatics refers to the integrated, systematic approach to tracing, measuring, analyzing, managing and displaying cross-level brain spatial data with multi-scale resolution. Brainmatics is a field of activity which, using a systematic approach, integrates all the means used to acquire and manage spatial and functional data of the brain, required as part of scientific, administrative, legal and technical operations involved in the understanding of neural processing. These activities include, but are not limited to, digital mapping and visualizing of the neuronal/glial/vascular networks, the connectome, projectome and transcriptome of the brain. Based on data of three-dimensional fine structural and functional imaging of neuron types, neural circuits and networks, neural-glial interfaces, vascular networks etc., with high temporal-spatial resolution and specific spatial locations, brainmatics makes it possible to better decipher brain function in health and disease, and to promote brain-inspired artificial intelligence (BIAI) by extracting cross-level and multi-scale temporal-spatial characteristics of brain architectural and functional connectivity.

Applications and Perspectives



R&D fields
Developing cross-level and multi-scale optical neuroimaging techniques as well as integrating all the means for tracing, measuring, analyzing, managing and displaying brain spatial data.

Providing a state-of-the-art and personalized training program to graduate as well as undergraduate students nationally and internationally, in Brainmatics research.

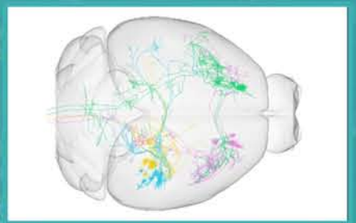
Contributing to society by means of transferring knowledge, hosting conferences and workshops, participating in professional organizations and in journals, and assuring that many programs of the Suzhou Institute for Brainmatics are open to the public.

NATURE's news about the research of Institute of Brainmatics:

China launches brain-imaging factory

David Cyranoski

Hub aims to make industrial-scale high-resolution brain mapping a standard tool for neuroscience



This reconstructed image shows how long-range neurons extend across a mouse brain.

See the whole article from the link:

https://www.nature.com/news/china-launches-brain-imaging-factory-1.22456

News Links in May

SIP expects greater achievements relying on innovation

SIP authority's foresight and persistent pursue for innovation over the past 24 years has led to the flourishing of local emerging and high-tech industries, which are expected to propel prosperous economic development in the area in future.

SIP's three pillar industries, including biomedicine, nanotech and AI, have maintained a high-speed growth, with an annual output value of RMB 61.5 bn, 50 bn and 35 bn respectively last year. Concurrently, a series of new and high technologies such as those for medical and financial services have seen great advancements, while the local talent pool has been expanded

All of the achievements have laid a solid foundation for SIP to set up an ecosystem with upgraded industrial structure and improved government-enterprise and enterprise-enterprise collaboration mechanisms to facilitate more efficient investment utilization, business incubation and technology development.

"We strive to become a world-class high-tech park," said Ding Lixin, deputy director of SIP Administrative Committee.

Suzhou Daily
http://www.sipac.gov.cn/english/news/201805/t20180522_720247.htm

CSSD awarded third place in ranking of Chinese industrial park operators

At the China Industrial Park Operators Research Results Release Conference and City-Industry Integration Forum held in Beijing on 31 May, the China Index Academy unveiled its 2018 list of China's Top 10 Industrial Park Operators. China-Singapore Suzhou Industrial Park Development Group Co Ltd (CSSD) ranks third on the list.

2018中国产业新城运营商综合实力TOP10

排名	企业名称
1	华夏幸福基业股份有限公司
2	上海张江高科技园区开发股份有限公司
3	中新苏州工业园区开发集团股份有限公司
4	招商局蛇口工业区控股股份有限公司
5	天安数码城（集团）有限公司
6	启迪协信科技城投资集团有限公司
7	亿达中国控股有限公司
8	上海临港经济发展（集团）有限公司
9	珠海华发城市运营投资控股有限公司
10	深圳市星河产业投资发展集团有限公司

To establish the ranking, the Academy made a systematic evaluation of the candidates' comprehensive strength in terms of a set of indicators that revealed their capacities for industry development, urban construction and business operation.

At the event, CSSD Chairman Zhao Zhisong delivered a speech to share the group's concept of pursuing integrated urban and industrial development as well as experience in industrial park management.

http://www.sipac.gov.cn/english/news/201806/t20180605_727410.htm

Shanghai Jiaotong University and technology enterprise team-up in AI development

Shanghai Jiaotong University (Suzhou) AI Research Institute and Miaozhen Systems, a Beijing-headquartered omni-channel marketing data and technology solution supplier, signed an agreement in SIP on 16th May to launch strategic cooperation in the application of AI perception and recognition technologies in business.

Based on the agreement, the two parties will give full play to their extraordinary expertise and experience in the field of AI to gear up research and development of related technologies and products for business purpose.

Suzhou Daily
http://www.sipac.gov.cn/english/news/201805/t20180519_719312.htm

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