

JCCU Industrial Tour 2024 to Beijing, China – Tour report

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In March 2024, 19 undergraduate students and Prof James Marrow, as the accompanying tutor, travelled to Beijing, China and nearby cities for the annual JCCU industrial tour. The attendees of the trip and the organisers would like to extend our thanks to The Worshipful Company of Armourers and Braisiers, The Worshipful Company of Ironmongers and the Department of Materials, University of Oxford for their generous sponsorship of the trip.

The organisers would also like to give credit to those from the Department: Dr Adrian Taylor, Tom Heath, Tim McAree and Ian Sutton for their guidance in going through the minutiae of administrative work, and Prof. James Marrow for being the accompanying tutor. In addition, the group thanks Prof Andy Godfrey, who received his B.S. and Ph.D. from the Department and is now a Professor in the School of Materials Science and Engineering at Tsinghua University, for his invaluable local knowledge and cordial reception of the tour cohort.

The group made visits to the following companies and institutions.

1. The Rio Tinto Office, Beijing
2. National Centre for Nanoscience and Technology
3. Tsinghua University
4. Qiangang Steel Plant of Shougang Group Co., Ltd.
5. Peking University
6. Procter & Gamble Technical Centre, Beijing
7. Beijing OriginWater Technology Co., Ltd.

Saturday, March 16th – Sunday, March 17th

This year saw a new attempt by the organisers in the mode of group travel – we allowed students who wished to stay in the Far East after the tour to arrange their own flights, while others flew out from London Heathrow (LHR) to Beijing Daxing Airport (PKX) on BA39 at 14:55. After an exhausting 13-hour journey and a calendar flip-forward, the group successfully cleared immigration and was picked up by pre-booked cars to the Hanting Express Sanlitun Hotel, our home for the next nine days. Students were accommodated in standard twin-bed rooms with breakfast included, which brought culinary delights to many. An afternoon to combat jet lag was given to the students who arrived together, followed by a quick Domino's & KFC dinner delivered to the hotel. All but one student managed to gather with their roommates by the end of the day, and that student, having suffered a flight cancellation, joined us the next morning.

Monday, March 18th

A night's recharge seemed to have been enough to invigorate the group – we left the hotel at 9am after breakfast for the Rio Tinto Office in the China World Trade Centre by Metro. We were warmly welcomed by Dr Sheng Chen, Vice President and Head of Commercial of Rio Tinto China, who gave a brief overview of the history of Rio Tinto as well as their business model in China. The seminar was followed by talks from experts in steel, aluminium and boron mining and production, respectively, which approached materials that we are really familiar with from a mining perspective. Lunch was kindly provided by the hosts in the form of bento boxes, during which we had the opportunities to sit down and chat with the employees – one of whom we found out to be an Oxford chemistry graduate!

Having bid farewell to the lovely people at Rio Tinto, we headed to the National Centre for Nanoscience and Technology (NCNST) in the afternoon. NCNST is a research institution co-founded by the Chinese Academy of Science and the Ministry of Education, who specialises in the fundamental and applied sciences of nanotechnology and is particularly known for their investigation of biological nanomaterials. We received a tour of the campus and learnt about the nanotechnology research activities happening in the labs. Some found the topics very intriguing and inquired about possible summer internship opportunities at NCNST, to which we were responded with a definite yes.

Tuesday, March 19th

A 10am departure from the hotel ensured that people who wanted to explore the Beijing nightlife receive a full night's sleep, too. After spending an hour on the Metro we found ourselves on the campus of Tsinghua University, one of the best universities in China. Our first stop was the Department of Chemical Engineering, where we were hosted by Prof Jun Xu who not only lectured us through his research in polymer science but also treated us to amazing food from one of Tsinghua's dining halls.



We then bid farewell to the chemical engineers and found ourselves on route to the School of Materials Science and Engineering. A 10-minute walk brought us to meet Prof Andy Godfrey outside the teaching blocks. We were given a lab visit around the building until the teaching period at Tsinghua came to an end, after which we got to meet some Materials Science students. They showed us around the campus and after mandatory tourist photos, we headed to the Jiasuo Hotel together to try out some signature Shanghaiese delicacies, which Prof Andy Godfrey kindly paid for on behalf of Tsinghua. With our bellies full and tired of socialising (or not), we returned to the hotel ready for a long journey out of town next day.

Wednesday, March 20th

As China is the number one steel producer in the world, the organisers felt obliged to bring the cohort onto a three-hour coach journey to the nearby – well, not in a UK sense – city Tangshan, which houses the Shougang Steel production plant. After a nice buffet lunch provided by the host, the group was shown the entire full-scale steel production line at the Shougang plant, including China's largest blast furnace and hot-rolling line. During the visit, the cohort was accompanied by Shougang's Chief Scientist Dr Jian Gong, who was really insightful and commended highly of the scientific depth of questions raised by the students. The visit finished early and we were able to get back to our hotel by 7pm despite the evening traffic, so some students decided to go out for hotpot.



Thursday, March 21st

We left the hotel at 10am for Peking University, where we were welcomed by Professor Zhang, Dr Lv, and Dr Zhao. They guided us through the historic campus, including Weiming Lake, university library, and traditional Chinese architecture, offering insights into the university's rich heritage. At the Department of Materials Science and Engineering, we explored cutting-edge research in functional materials and nanostructures. Lab tours provided insight into methodologies and applications, sparking discussions about ongoing projects. In the afternoon, we met PhD students who shared their



research experiences and academic environment at Peking. A particularly exciting opportunity arose when students were invited to apply for summer research internships at Peking University.

After an intellectually stimulating day, we went to the nearby summer palace and managed to climb up high just in time to get a great view of the city at dusk. We were also able to hire an electric boat for a very cheap price to sail on the Kunming Lake, which was indeed a highlight of the day.

Friday, March 22nd

Friday was the last day of industrial visits, and we started off by a 1-hour coach ride to the Procter & Gamble Beijing Innovation Centre. The group was warmly hosted by Dr Tony Guan, who introduced us to the R&D hub of P&G in Beijing. Its activities are focused on adapting global innovations to local consumer needs, developing new product formulations and advancing technologies in areas such as personal care, household products, and health-related applications. As materials scientists, we were particularly shown the pilot plant that involved packaging prototyping and perfume analytics. Despite having never done a course on packaging and aromatics, we were surprised by how closely related to materials some of these topics are.

In the afternoon, we made a visit to Origin Water's manufacturing plant, a leading Chinese company specialising in polymer membrane technology for advanced water filtration. Our tour began at the site museum, which provided an overview of the cutting-edge technologies enabling effective water purification. Exhibits detailed the processes and materials used in developing filtration systems, highlighting their critical role in clean water access. Next, we explored the manufacturing and research areas, where we gained insight into the development and testing of filtration devices. We observed various stages of production and learned about the research efforts aimed at enhancing membrane efficiency and durability.



Saturday, March 23rd

With an intentional free day on our itinerary, everyone had the chance to explore Beijing at their own pace. Some visited famous landmarks and museums, while others enjoyed shopping, local cuisine, or simply chilling at the hotel.

Sunday, March 24th

We set off early for the Great Wall of China, an experience many had been looking forward to. Taking the cable car up to the middle section, we climbed the remaining stretch on foot. The ascent was slightly tiring, but the breathtaking views and the sense of accomplishment made it all worthwhile. Standing atop one of the world's most iconic landmarks, we took in the vast landscapes before heading back down, reflecting on the incredible journey. This was followed by a group dinner at a nearby restaurant that specialises in Roast Duck, a famous dish that everyone has heard of but not yet had the chance to check out the authentic version. Although enthralled by the artful presentation and comforting taste of Chinese food, we had to conclude the trip as the plates got emptied out.



Monday, March 25th

Airport transfer was scheduled to leave at 7:30 am, so some decided to pull an all-nighter and went to watch the flag-raising ceremony at the Tiananmen Square. This was not part of the plan but to the surprise of the organisers, no one ended up missing the airport coach. Apart from the students who arranged their own return flight, everyone safely arrived at Heathrow around 5pm on the same day – and that is finally enough to say that we've had a wonderful and successful tour!