London International Youth Science Forum

Dominik Jakobczak

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LIYSF Report - Topic - Science for Unity

At the end of the 64th London International Youth Science Forum, during the final speech by Richard Myhill the director of LIYSF, he mentioned that describing the profound impact of these two weeks to family and friends is a challenging task. I wholeheartedly agree that the LIYSF experience exceeded my greatest expectations and is hard to do justice in words, but I'll attempt to convey its significance.

This year LIYSF had over 400 participants from 84 countries, a remarkable and rare opportunity that seemed slightly daunting at first due to language and cultural differences and made me feel a bit nervous before the event. But that nervousness didn't last long from the moment I arrived at the residence hall, I instantly connected with other attendees. Every day offered opportunities to form new friendships through optional visits, lectures, and scientific institution tours and each day helped solidifying the bonds we forged.

While a huge part of LIYSF emphasises meeting like-minded individuals sharing a passion for science, it equally emphasises scientific lectures by experts in their respective fields. The opening lecture by Nobel laureate Ben Feringa, discussing nanotechnologies and molecular motors was extraordinary. Despite my course being Physics with data analytics and this being a topic previously unknown to me, I still found myself delving into further research on molecular motors after the lecture.

Every lecture even those outside my field of interest proved valuable and interesting. One of my favourites was given by Professor Lee Cronin who discussed "Alien-Chemputation." His resilience in turning a concept into reality was inspiring. He also mentioned how he liked making people 'professionally angry' which I thought was very funny and showcases his personality perfectly. He shared his journey from scepticism to innovation, creating essentially what is a 3D printer but for chemical reactions and sharing his quest for search for alien life using

chemistry and what it would look like. This was one of the most inspiring and amazing lectures, showcasing the determination required to innovate.

Another lecture that caught my interest was by Professor Sir Steven Cowley and which focused on Fusion, its challenges and the potential fusion has in the future. This lecture combined with a visit to the Culham Science Centre ignited my fascination with Fusion and its related fields such as plasma physics and materials science. It has made me consider a potential future career in Fusion. It showcased that Fusion isn't just important for the future; it is the future.

What amazed me was how seemingly unrelated visits and lectures interconnected. For instance, a tour of the Department of Biomaterials at Imperial College shed light on the relevance of biomaterials to quantum computing which is a topic I aspire to research. It really showed how important science communication is, as topics such as quantum technologies require collaboration between many different fields and the ability of communication is crucial to success.

Exploration of London, it’s attraction and the rest of the England including the Natural History Museum, Stonehenge, Buckingham palace and many more was enriched greatly by the presence of fellow participants. These trips transformed into memorable experiences, fostering lifelong friendships and connections.

In addition to the main lectures, we attended specialist lectures and a study day with a wide range of topics to choose from. Two standout lectures were on machine learning and topology. The machine learning lecture, led by Dr. Noura Al Moubaye delved into the complexities of natural language processing, highlighting biases in AI models. It reinforced the importance of data quality in AI training and explained the process behind how the big natural language models of today work explaining a complex topic in a way that seems intuitive.

The topology lecture, led by Dr. Hannah Price showcased practical applications of concepts like Möbius strips, their relevance in industry and explored topology in higher dimensions which I can't express with words how cool it was to learn about. Dr. Price's unique perspective having been a previous attendee of LIYSF added depth to the lecture and it was great to see that a friend she made from LIYSf was still not just her friend but one of her best friends. The session also delved into the potential shape for the universe. It introduced me to the previously unknown world of topology, leaving a new appreciation for the field of Toplogy.

The specialist study day was definitely a highlight for me, with an amazing and insightful lecture on quantum technologies. Despite last-minute changes in the lecturer the lecture was exceptional. Which goes to show the quality of the lecturers selected to attend LIYSF. He was able to describe complex concepts with simplified examples so that someone with no prior knowledge of the topic would be able to understand it. It delved into mind-bending concepts like quantum thermodynamics and the influence of human thought on the universe.

This lecture further fueled my passion for quantum physics and the opportunity to ask questions after the lecture was amazing, I used it to get advice and a list of resources to use to further learn about the topic.

Other lectures included topics such as forensics, where we explored the challenges and advances in fields like vein identification, the limitations of blackbox AI due to unknown mechanisms, and engaging talks on climate change, gravitational lenses to detect dark matter, AI, and materials used for touch-sensitive robots, among many more great lectures. These lectures broadened my understanding of various scientific disciplines and their connection to each other. It provided me with a newfound appreciation of many science fields I haven't considered before and it makes me excited to know there's so many people working on so many unique ideas and projects and fuels my passion for science and knowledge.

In summary, the entire LIYSF experience was incredible. The two weeks passed by in the blink of an eye, filled with inspiring lectures, fascinating places, and most importantly amazing people. It reinforced the idea that science transcends boundaries. Brilliantly mirroring this year's theme of ‘Science for Unity’, bringing together individuals from many different diverse backgrounds. The shared pursuit of a brighter future through science led to lifelong friendships with people from all over the world.

LIYSF provided me with a new perspective on science and solidified my desire to pursue research rather than industry. It has given me a renewed motivation and a clearer direction for my future. It’s amazing how much I learned both from other attendees and from the lecturers.

I want to express my heartfelt gratitude to DCU for this incredible opportunity. It was an amazing experience, and I would recommend it to anyone who is able to go.