When I first heard about the CaMPUS European Placement schemes, the opportunity to work and live abroad over the summer was something I definitely did not want to miss. Having made my choice to study Materials Science in my third year, I was eager to learn more about the current research that was being done in the field, and get a flavour for post-graduate research. Ready to apply, I carefully browsed the locations available and MPIE in Düsseldorf was one that stood out. On MPIE’s website I learnt that it is well respected in its field, and prides on holding a very international team of employees with nationalities ranging from local Germans, to Chinese, Iranians, Russians and more. I hoped that this meant that there would not be a significant language barrier (the only German I knew was from long-forgotten classes when I was 11) which turned out to be true as the common language was English. The state of North Rhine-Westphalia also attracted my love for travel as Düsseldorf is very well connected to other German cities and the bordering countries.

The area of my research whilst at MPIE was the “Multiscale Tribology and Indentation of Pearlitic Steel”. Admittedly, when I first received the title, I had no idea what “tribology” meant and immediately panicked. I asked my supervisor for any suggested reading material and scientific papers, and I also found some learning resources from the fourth year course on tribology to get me up to speed. The aim of my project was to compare and contrast the response of a pearlitic steel to indentation and scratching. My work involved preparation of samples by mechanical grinding and polishing methods, and then controlled indentation and scratching of the smooth surface. The indenters I used required thorough inductions, and often some tentative translation of the German software! After deformation using these techniques, I prepared cross-sections of the sample surfaces to inspect their deformation using Scanning Electron Microscopy (SEM). Using this technique, we were able to observe a range of features in the steels and conclude that the variety and frequency of deformation mechanisms observed as a result of dynamic wear is much greater than that for static wear. We also investigated the dependence of the deformation on normal force, scratch velocity and indenter shape.
Alongside my personal project within the department, I also had the chance to get to know and learn from many of my colleagues thanks to the highly collaborative nature of the institute. I very quickly got the impression that everyone had their own specialism, and was willing to share their expertise whether it was about using equipment, or experimenting with new techniques. During the two months I was able to sit in on weekly seminars on people’s progress with their research and was given tours and introductions on a range of scientific equipment that I had only heard about in lectures. At the end of placement, I delivered my own (very nervous) presentation on the work I had done as well! During the lunch and coffee breaks, the department would gather in the common room. The conversation usually revolved around cake, especially as quite often someone will have brought an edible treat for everyone to try from their travels. The PhDs in the institute often did group outings together and I joined them for a “Tree2Tree” climbing course and a BBQ in Duisburg. Here I had to be rescued from a particularly challenging course whilst my colleagues shouted encouragement from below.
In the city centre of Düsseldorf there always seemed to be something new going on. This ranged from the annual funfair “Kirmes”, to sporting events such as the Grand Départ of the Tour de France and Germany winning the Russian Confederation Cup! There was a huge range of tourist attractions in the area including the Imperial Palace of Kaiserswerth, Schloss Benrath, the Konigsalle shopping district, as well as many museums and art galleries. Over the weekends I had the chance to go further afield to Luxembourg, Frankfurt, Aachen, Cologne and Bonn to name a few!

Living in a flat-share made it easy to meet other students visiting Düsseldorf from nearby Germany, Poland and Sweden. We even organised an international dinner together to sample cuisine from each other’s homes. Our landlord also hosted a party, or “Sommerfest”, in our garden which was the perfect chance to sample some German sausages, or “bratwurst”, and Düsseldorf’s traditional mustard. I also tried Düsseldorf’s historical beer “Altbier” which I definitely did not have a taste for!

I am so grateful for the opportunity of this summer placement, and I would like to take this chance to sincerely thank the Worshipful Company of Armourers and Brasiers for their generous support that made it possible for me and many others. Even though the two months were filled with different challenges such as accidentally destroying my first steel sample (and getting used to German keyboards!), I know I have learnt many things and experienced the rich culture of Germany. This placement has taught me a range of practical and analytical skills which I will carry forward for the rest of my planned future career in Materials Science, and my confidence in a metallography lab has grown hugely. Later this year, I will also be able to apply my skills in SEM imaging to my studies. The placement has highlighted the value of perseverance and resilience in scientific research. In conclusion, my time in Germany was an unforgettable experience!