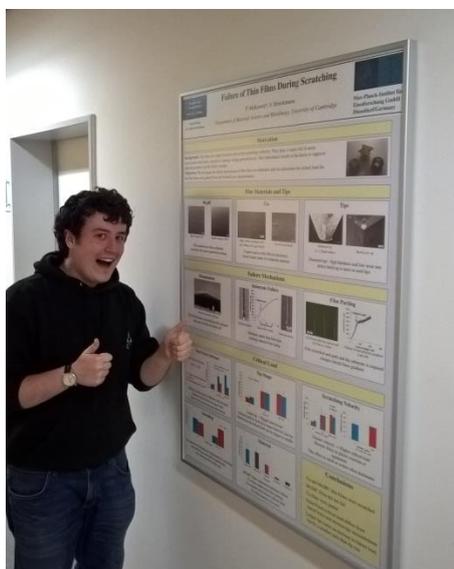


## Armourers & Brasiers' European Placement Report

I am Philip McKeown, heading into my 4<sup>th</sup> year of Materials Science at the University of Cambridge. This summer, I was taking my first steps into the world of scientific research at the Max-Planck Institut für Eisenforschung, or MPIE, in Düsseldorf, Germany. This was a great opportunity for me to see what life is like in research, and also to see a part of the world I'd never visited before!

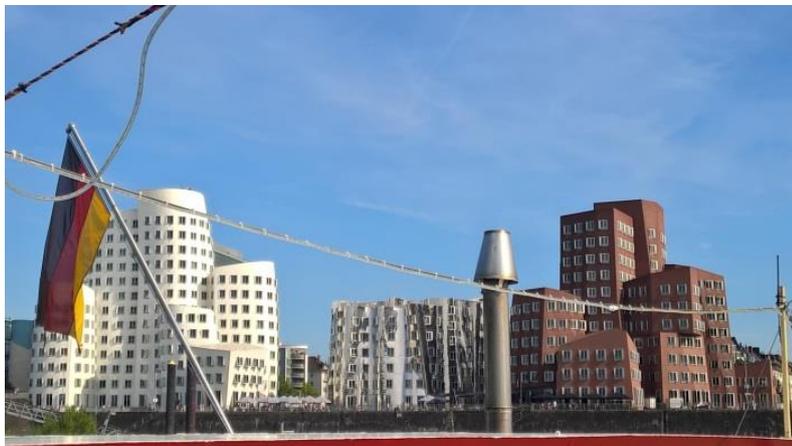
Armed with two years of pre-GCSE German and A-level French, I was not too confident with my ability to communicate with people when in Düsseldorf. However, I found that everyone at MPIE could speak English, and there were people from all over who, like me, were more comfortable speaking English than German! My supervisors were incredibly welcoming and made me feel right at home. Out of work, I was living in a shared flat which I found on a website recommended by MPIE. It was well within my budget and only a five minute walk from work! Like MPIE, the people in my flat spoke English and were welcoming and fun. Sadly, the impressive language skills of everyone I met meant that I could only improve my "holiday German" in shops and cafés. I did however get into a good conversation with a Moroccan man I met in the city centre – so my seven years of French were not all useless!

For my project, I was investigating the "Failure of Thin Films during Scratching". So using a diamond tipped nano-indenting machine, I was looking at the point of failure and the mechanism of failure of several thin films. I got a lot more independence than I was used to for the project, which meant for a day or two at the start, I spent more time than I perhaps should have twiddling my thumbs and waiting for direction, but I soon became more comfortable and in a single day, could be performing and analysing up to 60 scratches. I got to use several new machines, and some that I had previously encountered, but had a lot more freedom with – such as nano-indentation, electron microscopy and atomic force microscopy. I really enjoyed learning new techniques and discussing my progress with my supervisors. I also had the chance to produce a poster for the department on my research, which is now hanging proudly outside the office in which I was working.



*Me and my finished poster on the walls of MPIE*

Düsseldorf was a wonderful city to live in for the summer. Aside from the endless 30+°C heat (which coming from Ireland, I only thought happened in films), there were lots of things to see and do. It is not a tourist city, like Rome or Paris, but Düsseldorf had really friendly people, and the Altstadt (Old Town), was always buzzing. The first weekend I was there, there was a huge festival happening on the banks of the Rhine. There were funfair rides, music tents, food from all over Germany and Europe and an entire area which was Bavarian themed. I also went to local cafés and pubs trying out the local cuisine. My culinary highlight was enjoying a plate of blood sausage in apple sauce washed down with the local “Altbier”. The most impressive buildings in Düsseldorf were a trio of modern Rhine-side buildings called “Der Neue Zollhof” designed by Frank Gehry, which were especially spectacular when viewed from a boat on the river.



*The Gehry-designed “Neuer Zollhof” as viewed from the Rhine*

The whole experience has made me consider even more a career in research and materials science. I don’t know what I expected from the summer, but I found it very enjoyable, and encouraging. It makes me very excited (and less nervous) of life beyond the Cambridge Tripos having had this opportunity.

All this would not have been possible without the support and organisation of the Worshipful Company of Armourers & Brasiers’, so thank you very much for a great summer. Also thank you to my supervisors in Germany Prof. Frank Stein and Dr. Steffen Brinckmann for guiding me and making my experience all the more enjoyable.