

Non-technical A&B report for euro placements: EMPA, Thun

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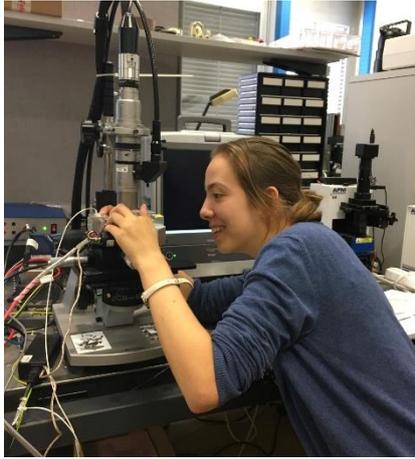


Spending Swiss national day hiking

In the summer after my second year at Cambridge, I spent 11 weeks in Thun, Switzerland, working at EMPA, the Swiss federal laboratories for materials and technology research. I chose to apply for this placement partly because the project was related to nanomaterials, which was an area of research I was interested in learning more about, and partly because the location is absolutely stunning. Thun is situated by the river

Aare and the beautiful lake Thun in the Bernese alps, and even from my office there was a gorgeous view of snow-topped mountain peaks.

EMPA Thun had around 70 employees from about 20 different countries, including Poland, Italy, France, Hungary, Austria, Finland, Russia, the USA, Ecuador, Israel, India, China, and of course Switzerland. This allowed for some very interesting conversations, especially concerning how education systems differ in other parts of the world and how much longer some degree courses take, which made me feel lucky to be studying in the UK. I was initially apprehensive due to never having studied German, but many of my colleagues did not speak German either, and the common language was English. At the shops and train stations I managed to pick up some key words, though my German did not significantly improve. In fact, I got to practice my French more than German, when on a day trip to Lausanne and when visiting Geneva.



At work, positioning a sample

I had expected to be given specific tasks to do, and to be left alone to figure out problems. However, I actually had a lot of freedom to choose which methods I wanted to use and which measurements I wanted to prioritise, as well as a lot of support from supervisors when I asked. My project involved investigating the mechanical properties of thin metal oxide films on flexible plastic. Thin films have potential applications as gas barriers for food and drug packaging, as well as semiconductors. However, when plastic is bent or stretched, the films crack, making them less effective gas barriers. I followed on from the work of Georgina Robertson, who went there last year, carrying out tensile tests and comparing the strengths of alumina films prepared using slightly different methods, zinc oxide films, and multilayers of alumina and zinc oxide with different layer thicknesses, in order to find out how films can be designed to have better strengths.

One issue faced was that the machine was not working for a few weeks. During this time, I did some reading, practiced using some software, and also left work early to go swimming in the lake most evenings. This was great as it was very hot weather those first few weeks. I made up for this by working more hours towards the end of the project. To my initial surprise, no one seemed to mind what time I went to work, but I soon learned that Swiss culture is much more based on trust, and that they trusted me to make up the right amount of work. Although a culture shock for me, it was a very pleasant one, especially as it meant I could leave my bags unattended and go swimming.

I made the most of living in the Swiss alps, by going on hiking trips up the mountains, cycling around the lake, jumping in the river and going on boat trips. Colleagues at EMPA could not have been more welcoming. We played football together, went on group hikes, had some BBQs and parties after work, and a master's student even taught me how to do bouldering which required a lot of patience on his part. However, the most memorable excursion involved patching up some inflatable rubber dinghies and floating down the river Aare all the way from Thun to Bern, the capital of Switzerland.



Hiking near Lake Thun

On the weekends I took the opportunity to explore Switzerland, which included hiking for 2 days in Grindelwald, visiting Bern for the Einstein house and historical museum, and going to Basel to see the art gallery, bridges and cathedral.

From this placement I think I have gained a lot of independence and confidence. EMPA gave me the opportunity to see materials research being applied for use in industry, and to learn more about a career in materials science research. Although I am still not sure whether this is something I will do, I'm definitely enthusiastic to pursue a masters in materials science, whereas I wasn't before. In addition, I've developed valuable skills such as giving presentations to others and writing a technical report.

Overall, this has been the most incredible experience, which absolutely exceeded my expectations. I would definitely recommend future students to consider applying, and would like to return to Switzerland myself if possible. Thank you to the Worshipful Company of Armourers and Brasiers for the support which made this possible, and to everyone at EMPA including supervisors Dr. Utke, Dr. Putz, and Dr. Niemelae for all the help they provided.