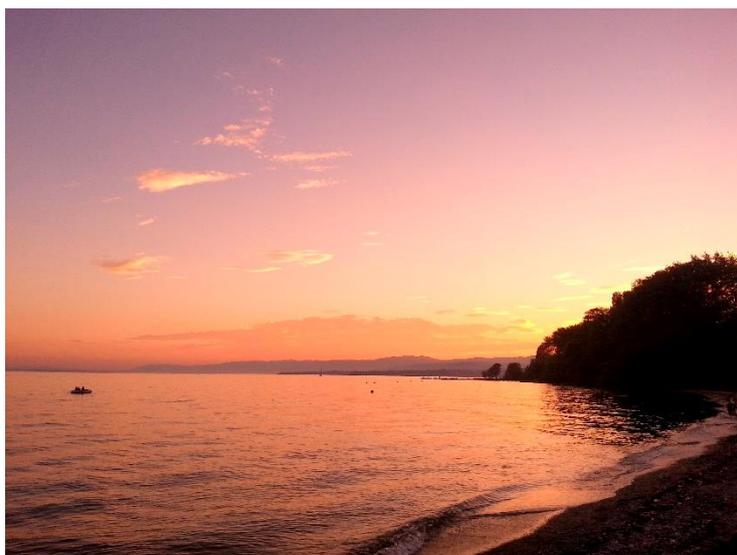




At first, I wasn't going to apply for the CaMPUS European placements – I had only just finished my second year of university and had very little lab or language experience. I decided to apply anyway on the off-chance I was picked, and to my surprise I was accepted for a placement at the Supramolecular Nanomaterials and Interfaces Lab (SuNMIL) in EPFL, Lausanne.

Before arriving I was anxious about my inability to speak French without receiving perplexed looks. I was also a physics and materials student, heading into a very chemistry-heavy department. I hadn't taken chemistry since A-levels, which feel like a lifetime ago! In the back of my mind I thought I would turn up, be told something in French, and placed in a big empty lab full of mysterious bubbling liquids and expensive machines.

In reality, everyone at SuNMIL was incredibly friendly and welcoming. The lab consisted of masters, PhD and post doc students, with a diverse range of scientific backgrounds and coming from all over the world, from Brazil to China. Luckily for me, English was the official language of the lab, so whilst I was inept at French in day-to-day life, I could comfortably understand everyone at work.



*The lake at sunset, a typical evening after work.*

Switzerland is a breathtakingly beautiful country. Wherever you look there are dramatic mountainous backdrops surrounding the lakes and valleys. I found myself being much more active here, cycling or jogging down to the lake most days for a swim, and hiking on the weekends for spectacular views. Cycling around the lake, I wound up at makeshift festivals, remote control car races (completely with ramps), outdoor art exhibitions and there were endless barbeques complete with slip 'n' slides and slack roping. I was also lucky enough to be around for the Swiss National Day to see fireworks from all the towns around the lake, and to visit Geneva Festival with the largest fireworks display in Europe.



*The USA has "greatest country in the world". The Swiss are a little more modest.*

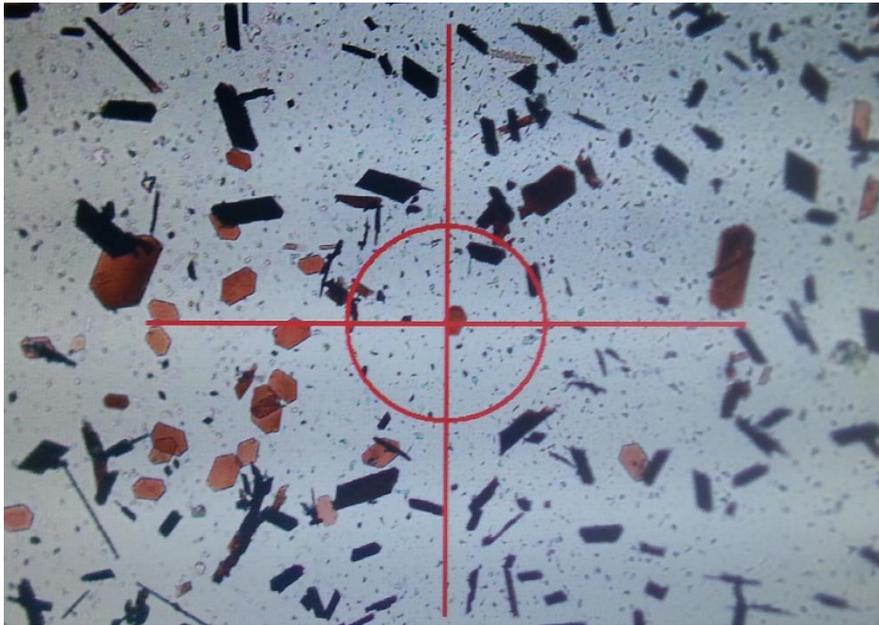
For my project, I was not given a specific task to complete, but instead was helping student Sergio Allegri with his PhD. His work is focussed on the electrical properties of crystals made from particular nanoparticles: 44 silver atoms in a ball, surround by 6 organic ligands, and stabilized by counter-ions. These crystals are of particular interest because they can exist in 2 different states, dubbed 'on' and 'off'. In the 'off' state, the crystal acts as an insulator. At a high enough voltage, the crystal switches to the 'on' state and will conduct. This is a novel property for a single crystal to have, which could have applications in technology, e.g. as a memory device.

I was focussed on measuring the electrical properties of the crystals, concentrating on what factors affect the transition from 'off' to 'on'. The crystals were microscopic, and incredibly brittle. I spent most of the project prodding (and breaking) these crystals with micromanipulators. The work was sometimes tedious: one time I had finally found a crystal with a consistent transition voltage: halfway through a one hour set of measurements I coughed slightly, and the crystal (and consequently my hopes and dreams) suddenly shattered.



*The most challenging part of the placement: putting a glove on with one hand.*

Then again, the work was often very rewarding. There is so little known about these crystals that every measurement was helping discover something new. Whenever I saw something strange happening, it was impossible to simply look up why it happened, and instead requires further experiment. This was a huge but welcome change to my previous practical experience in university, where every experiment is designed to work and we know what the results will be before the measurement is made.



*Pew pew... Gotcha. Taking spectra of the crystals before and after switching them on: after about a week of measurements, analysis and false positives caused by systematic drifts, I found that there was no change.*

I'm not sure what I was expecting from this placement. In the back of my mind I wanted to stumble across something ground-breaking and be put on the front cover of *New Scientist* with my Nobel prize. My time in Switzerland was a great reminder that things aren't so simple – making discoveries is a long and challenging process. A lot of the work is summarised by Murphy's Law: whatever can go wrong, will go wrong. Unlike the tried and tested lab practicals I'm used to, in real experiments there is always something you've forgotten to take into account that messes everything up! But it is fun and rewarding to have those "aha!" moments, even if it's just realising your own mistakes.

I may not have made an earth-shattering discovery, but I had a great time in Switzerland, improving my confidence in languages, using unfamiliar equipment and dealing with unexpected problems. I'm still unsure about doing a PhD myself, it's not a simple decision. However, this trip has made me realise that living/working in another country is not nearly as daunting as I thought, opening up countless new options for what I want to do in the future.

If you're reading these reports, like I was, unsure about whether to apply for a CaMPUS Euro placement – go for it! I was apprehensive: I thought my language and technical ability weren't good enough, but you will quickly pick up the necessary skills and everyone on the scheme is incredibly understanding and friendly. You won't regret it.

I'd like to say a huge thank you to everyone at the Cambridge materials department and SuNMIL, Prof. Stellacci, Sam Jones, Chiara Donini and Sergio Allegri for all their help and patience. Of course, none of this would have been possible without the generous support of EPFL, Clare College and The Worshipful Company of Armourers and Brasiers. Thank you all for an amazing summer.