

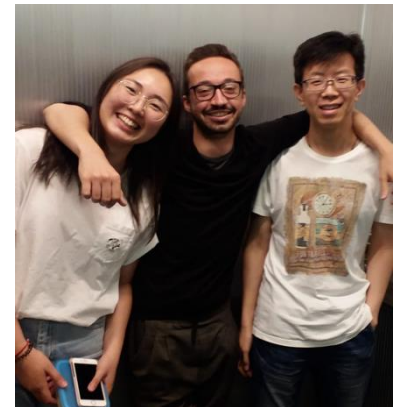
Before continuing onto my masters year of studying materials sciences, I was curious to see what research in the field could involve and whether it was something I would enjoy going into after graduating. As such, the opportunity to do a research placement at a European institute through the CaMPUS scheme was something I could not pass on. I was very excited when I found out I was offered a placement in the Interface Physics and Magnetism (Intermag) group at ETH in Zürich, especially as Switzerland was a country I had always wanted to explore for its beautiful scenery (and chocolate).



The view from Zurich city centre.

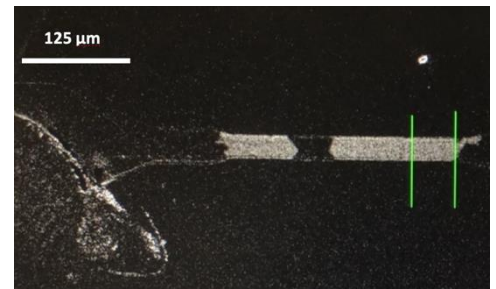
Having never been abroad, away from family for such a long time and with barely any knowledge of German (and even less of Swiss German) I became increasingly nervous as the departure date approached. However, it was comforting to know that I wasn't alone, since two other people from Cambridge were doing similar placements at ETH. As soon as I arrived, however, it was clear that I had nothing to worry about. Both my flatmates and the people in the research group were incredibly friendly and welcoming and taught me everything I needed to know during my stay. Here, in addition to experiencing the local culture first hand, I also learnt a lot about many other countries from Germany and Italy to Turkey and the Czech Republic as I found myself among a very international group of people both in my working and living environment, where English was the common language.

Over the course of 8 weeks, I worked alongside masters, PhD and post doc students coming from a wide range of scientific backgrounds and who were more than happy to help me out whether it be rethreading the (miniscule) needle of the wire bonder, interpreting my results or just giving me general advice about a career in research. I also really enjoyed learning about what projects they were working on. My project was titled 'Current-induced domain wall motion in insulating magnetic garnets' and expanded on previous research pioneered by the group using systems of thulium iron garnet (TIG) capped with a layer of pulsed laser deposited platinum. These devices are attractive for spintronic applications in future logic and memory technologies. In particular, I was investigating to see whether DC magnetron sputtering, a simple and more commercially scalable technique, could produce devices of comparable quality as well as whether swapping the platinum for a tungsten layer could enable faster domain wall motion or allow a smaller current threshold for switching.



With the masters students: Mickey and Jialiang.

I spent the first week reading up on past literature and familiarising myself with previous work as well as the theory behind my project. At first, I felt overwhelmed by the concepts that, to me, were completely new. However, the others in my office always reassured and helped me and my supervisors were really patient and carefully explained the relevant phenomena. After wire bonding electrical connections to the sample, I began using the home-built wide-field polar magnetic optical Kerr effect (MOKE) microscope which allowed visualisation of changes in magnetisation in the devices through differential images. At times the work could be a little challenging, frustrating and tedious. I spent a large amount of time trying to calibrate and adjust the magnets or fix other components of the MOKE, and, more often than not, I would sit in confusion as to why I wasn't observing anything only to realise I hadn't switched the current output on.



Differential MOKE images enables visualization of change in magnetization state (white).

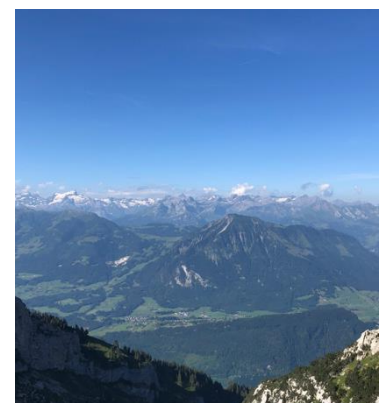
Nevertheless, the work was also much more rewarding than I expected, especially knowing that some of the unexplainable results could lead to new discoveries. The group all had coffee breaks and lunch together which made it easy to get to know everyone really well outside of work and I really enjoyed the dinners and drinks that we had during some of the weekends. Being part of intermag made me realise and appreciate that scientific discoveries are a challenging and difficult process as well as just how much time and hard work goes into writing a single scientific paper.

During the evenings and the weekends, I also got to know the people in my flat really well whether it be through flat barbeques, hanging out by the lake or just watching tv together and it was interesting to learn and hear about undergraduate life in ETH. I was shocked to hear that their exams take place during August making their summer holiday only two weeks long! Along with Caitlin and Ed (the two others from Cambridge), we explored the various sights, museums, galleries and cafés in Zürich and tried to pick up a bit of Swiss-German. The highlight for me was going up Mount Pilatus in Lucerne, a nearby city, and seeing the breathtaking views of the mountains and lakes, that I had only seen in pictures before, in person. We were lucky enough to be around to see the incredible fireworks displays during the Züri Fäscht (which happens once every three years) and the National Day. The three of us also went along to the Street Parade and it was really strange seeing the picturesque and relatively quiet streets of Zürich being transformed into such a bustling sea of people.



Sightseeing with Caitlin and Ed.

I wholeheartedly recommend anyone considering whether or not to apply for the CaMPUS scheme to do so. It was such an amazing experience, not only through getting to know another country and being immersed in its culture but also through the friends I have met while doing the internship. During my stay I have increased my confidence in communication as well as with dealing with unexpected problems and applying for a PhD is something I am now seriously considering. While a career in research has been something I have



The view from the top of Mt. Pilatus.

thought about in the past, it had never crossed my mind that I could do it in another country and I feel like the experience has opened up a lot of new options for what I could do after graduating.

I would like to thank everyone in the intermag group at ETH, especially my supervisors Dr. Saül Vélez and Dr. Can Avci, as well as the Cambridge and ETH materials department. I am thoroughly grateful for the generous support of ETH, St Catharine's College and finally The Worshipful Company of Armourers and Brasiers, without whom the placement would not have been possible.