I began my Natural Sciences degree at the University of Cambridge with the full intention to specialise in Chemistry, but it was in the driving rain and hail of my first-year field trip to Arran that I started to seriously consider a degree, and career, in Earth Sciences. Although I had enjoyed the Earth Science course practically from the first lecture, it was that week on Arran that sealed the deal; the weather was atrocious the entire week, I knew no one else on the trip and I quickly discovered neither my waterproof trousers or walking boots were any match for what Scotland had in store weather-wise! Despite these challenges, I returned home inspired, every single teaching assistant and faculty leader on the trip had become my hero, I too longed to walk the coasts and hills, effortlessly reading the rock textures and the landscape and understanding the forces that helped shape it all. I've since realised it's not quite that simple and they'd in fact been visiting Arran and those outcrops for many years, but the dream and the inspiration remains!

I'm currently completing my masters (4th) year of the undergraduate Natural Sciences course at the University of Cambridge in the Department of Earth Sciences. The overall Natural Science course at the University of Cambridge is laid out to enable students to do a range of disciplines in the first two years before specialising in the final two years; I studied Earth Sciences, Maths, Physics and Chemistry in my first two years, before specialising in Earth Sciences last year. I've really enjoyed the breadth of the Natural Sciences course, and it has enabled me to understand more completely the underlying theory to the methods and principles I have learned in Earth Sciences.

One of my favourite parts of the Earth Sciences course so far was the independent mapping project. This involved 6 weeks in the field during the summer of 2016, followed by creating maps, cross-sections and writing up a 30-page report the following autumn. The project was entirely self-organised, groups of 3-6 researched and planned the location and logistics of their project, and obtained the necessary funding. I mapped in the foothills of the Spanish Pyrenees, in an area with some incredibly interesting overturned folds cut through by faults.
For my masters project, I'm working with John Maclennan, looking at mush disaggregation in the Bardarbunga volcanic system in Iceland. Over the summer, I spent a week with John in Iceland, collecting samples from all over the island. It was an incredible experience, the landscape itself, dominated by volcanic and glacial morphology, was awe-inspiring, as well as the opportunity to be involved in a research trip. I learnt a great deal, both about Icelandic geology and academic life, and I'm incredibly excited to get into analysing the mush nodules I collected.

Quite early on in my studies I developed a preference for igneous petrology. I found thin sections fascinating, especially the process of reconstructing a detailed rock history through identification different minerals and textures. It is this problem-solving methodology of Earth Sciences that I particularly enjoy and as I've progressed through my degree we've been introduced to more and more tools for solving problems. I consider myself a highly numerate scientist with a particular strength in chemistry and the application of mineralogy and chemical analysis to problems within igneous petrology.

What first attracted me to Caltech was the work of Claire Bucholz and Paul Asimow. I have spoken with both Claire and Paul about possible project ideas for a PhD I'm even more excited about the chance to work with them. Their range of ideas are a perfect fit for the research I'd like to carry out. In particular, regional igneous petrology studies using a large range of techniques, including fieldwork, to look into different igneous bodies, the particular processes that formed them and what this can tell us about modern volcanic regions. I also love the course structure at Caltech, using the first year to carry out two different, smaller projects sounds ideal as it gives students the chance to settle in and get to know more about the department and the supervisors before settling into their main PhD project. Even after three years of studying Earth Sciences, I still find I'm learning about new avenues I'd not even considered with each new paper I read or seminar I attend, therefore that early flexibility really appeals to me.

My love of geological sciences stems from a desire to understand the Earth and the processes that govern the behaviour we see at the surface. This has been honed in the direction of igneous petrology, in particular processes involving crustal magma and how study in this area can lead to a better understanding of volcanic hazards. I constantly feel like there're so many interesting ideas out there I haven't even been introduced to, let alone had the chance to explore. Continuing from there I'd want to conduct my own research, working to solve problems and contribute to increased understanding of igneous systems. I also love the opportunities Earth Sciences gives me to travel and work outdoors, one of my goals for the future would be to have a job that includes a large amount of field work, be this in research or industry. Caltech seems the perfect place to pursue these goals, with world class facilities, great course structure and a diverse Earth Sciences department carrying out fascinating research.