

Q&A for A&G Magazine

What's the problem with research travel?

My supervisor, Jim Wild, directed me to an article in Nature that used the American Geophysical Union (AGU) Fall Meeting as an example. Here's a quote: "We calculate that 28 000 delegates travelled 285 million kilometres there and back, almost twice the distance between the Earth and the Sun. In doing so they emitted the equivalent of about 80 000 tonnes of CO₂. This is about three tonnes per scientist, or the average weekly emissions of the City of Edinburgh."

I wanted to go to the AGU Fall Meeting, in San Francisco, in 2023, and I thought it would be the perfect opportunity to travel a bit more sustainably and disseminate my work further as well.

What's your research area?

I'm currently a third-year PhD student at Lancaster University. My research involves studying the effects of space weather on railways, specifically railway signalling systems, which are important for the safety of railways and have been affected by space weather in countries outside the UK. We're modelling a test case in the UK, to see if systems here are also susceptible to these kinds of hazards.

What's the link with Ottawa?

When I brought up the idea of this train journey to David Boteler, who's the head of the Space Weather group at Natural Resources Canada and a co-author of the paper I'm working on, he thought it was fantastic. He suggested I come to Canada to visit Natural Resources Canada, and talk to the Canadian rail authorities, who are interested in space weather effects on rails. While most railways in North America are still non-electrified, climate change is driving a move towards more sustainable options. David then explained I could easily get the train from Canada to the US and carry on my journey from Chicago. He also has contacts in the Space Weather Prediction Centre in NOAA in Boulder, Colorado, and with the train travelling through there, I am hoping to stop off for a couple of days and give a talk there too. So it changed from this epic rail journey into more of a North America science tour!

That should be a great opportunity to build up some contacts

Developing my network is something I'm really keen on considering that the start of my PhD was during the pandemic, and I've not really had much chance to go to an international conference and network in person. I think it's very important for graduate students to show that we're committed to combating climate change, especially when we're on a knife edge. You always hear these buzzwords in the news, but you hear it so much that it's easy to become numb and take a back seat. But I think it is really important to take an active role. We worked out that by minimising my flight, by going from the UK to Ottawa rather than the UK to San Francisco, you save about 40% of the total carbon emissions of the journey, which is pretty staggering. Right now, I'm working on an itinerary. There are a lot of moving parts, if I'm going to stop off and give talks and meet people. I want to make sure that I can do those things, and get to San Francisco in time for the conference. You have to try to work with the Amtrak timetables and try to minimise the time you're going to have to stop over.

Is it more expensive to go by train?

Yes, certainly more than just flying. But I hope to raise a bit of awareness for these kinds of journeys, to show that they are manageable. And perhaps if more people are interested in taking the train, then the train companies will put on better services. But a really nice benefit of these sort of slow travel methods is that you can work while you're on a train. I don't think many people get a lot of work done on a plane. And you can't stop off and visit different people in different institutions on a direct flight from London. When you're on train and you've got a table, you've got a beautiful view outside

your window, I think you can make the most of it. That's a really big benefit to these alternative modes of travel.

Do you think this could become normal?

I think that normalising train travel to attend conferences within Europe is certainly doable. And perhaps an extreme journey like the one that I'm going to be doing is good to show that we're really lucky to have the infrastructure we have in Europe. Within the UK, there really isn't an excuse to fly domestically. I do fully comprehend that it's not an option for every student. When you can fly from London to Vienna for £40, it's very hard to look at that and wonder why one would spend £400 on a train journey.

What would help to change this?

While our institutions and funding bodies are already starting to take steps to promote slow travel as the preferred method of travel, I think they could be doing more to provide financial support to realise that goal. But I also think publicising these kinds of journeys is also a good way to show that it's possible. I guess the original idea for this journey clicked when I saw the #TraintoEGU trending on Twitter, from people going to Vienna by train from all across Europe. I thought, that's a great way to travel! So I'm going to keep a diary of the journey and hope that people read it and realise that graduate students are committed to reducing our impact on the climate while retaining the benefits to our careers by attending international conferences in person. I'll also be documenting the natural beauty out of my window showing the planet that we're so desperately trying to save and all the wonder that we could lose if things go wrong.