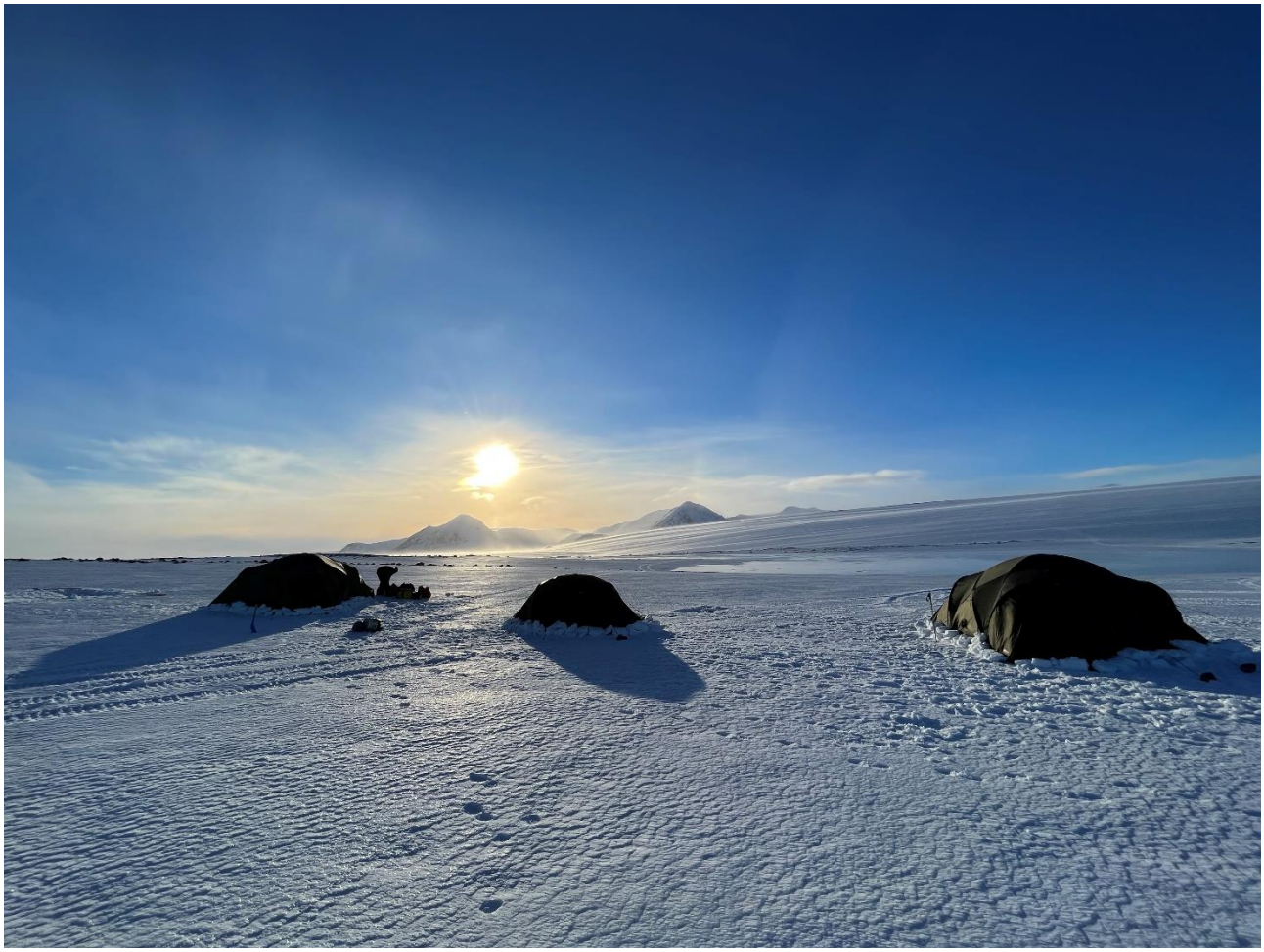
Frozen Fieldwork Expedition to Iceland's Isolated Interior

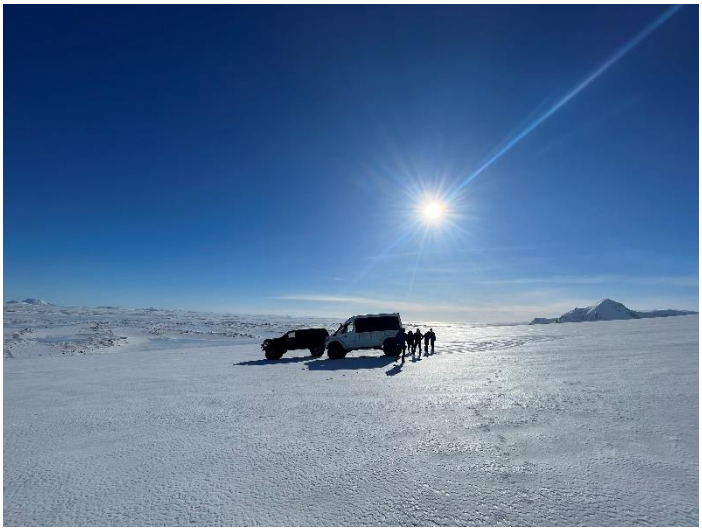
Written by William Wenban, July 2023



I distinctly remember the first time I saw a glacier with my own eyes. I was 8 years old and on the famous Montenvers train up to the mighty Mer de Glace in Chamonix. This was the catalyst to a future obsession with the mountains and the cryosphere. Now 27 and studying for a PhD in glaciology at the University of Sheffield, I have been back to the Mer de Glace a few times since and even in my short lifetime, the changes I can see are excruciating. The mesmerising sea of ice, while still awe inspiring, sits hundreds of metres lower in the valley and is heavily covered in debris on the top. It is experiences like this that inspire me to pursue a career amongst the glaciers, to study and record them for the future generations that will never get to see just how big and impressive they once were.

Towards the end of last year I was approached by a friend and fellow PhD student Remy Veness, who had an idea for an exciting expedition into the centre of Iceland to carry out some fieldwork on a poorly understood and rare glacial phenomena. The feature in focus was drumlins - an elongated kind of hill composed of unconsolidated till that are formed beneath large glaciers and ice sheets. No one has managed to work out quite how or why they form. Drumlins themselves are not overly rare, they can be found dotted around large swathes of North America and indeed the UK, relics of the enormous ice sheets that once covered our lands in the last ice age over 20,000 years ago. Fresh drumlins that aren't millennia old, though, are rare and it just so happens that one of the few places in the world where you can find drumlins actively emerging from beneath the ice is at Iceland's central ice cap - Hofsjökull.

Remy had found a lovely site of emerging drumlins that had never been studied just 8km away from Iceland's F26 dirt road - an isolated off roading route stretching North-South through the interior. The plan was to get dropped off, spend a week or so camping by the ice cap and survey the area using ground penetrating radar (GPR) to scan through the ice and find the drumlins on the bed below. Whilst I won't bore you with a lengthy explanation of the science (look out for a future AAC lecture for a little more detail), essentially we wanted to compare the orientation of the subglacial drumlins with the drumlins that had already emerged in front of the glacier (proglacial). This would help us towards unravelling some of the great mysteries surrounding how/why they form!

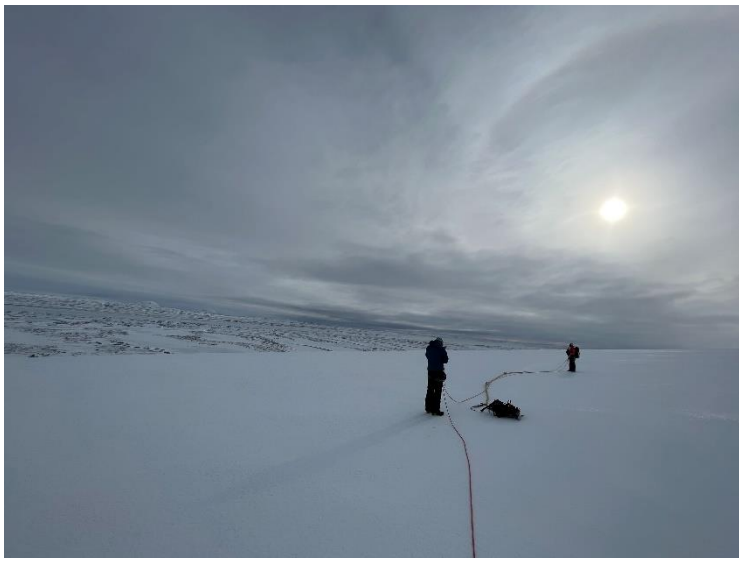


Anyway, the one catch with this fieldwork is that the radar systems don't work very well when there is a lot of meltwater around, as this disrupts the signals and ruins the data. Consequently, GPR work for glaciers is nearly always carried out in winter and camping out in the isolated interior of Iceland in winter was going to be quite the undertaking and would require some serious planning.

As the months passed, the plans solidified and after a few drafts of team members (academics can be hard to pin down), we finally had our team: alongside myself and Remy would be Pete Tuckett (fellow Sheffield PhD student), Dr Emma Smith (Uni of Leeds post-doc researcher) and Dr Rebecca Schlegel (Swansea Uni post-doc researcher). Emma and Rebecca both have extensive geophysics experience working with the British Antarctic Survey across Antarctica, so we were thrilled to have them on board.

We also managed to secure funding from the British Society for Geomorphology, Mount Everest Foundation and of course the very lovely and generous AACUK expedition fund!

After a couple of different companies told us it would not be possible to drop us in the interior in winter (the off-road tracks are usually quite inaccessible outside summer, after all), we were directed to South Coast Adventures.IS who told us it wouldn't be a problem, they could get us there with their fleet of 'super-jeeps'.

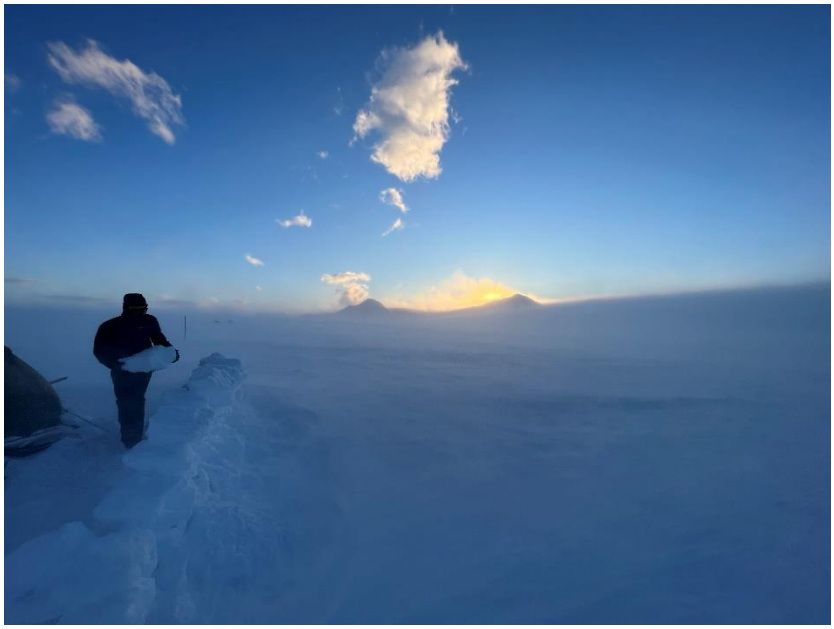


Come mid-March we finally set off and landed on a beautiful sunny Icelandic winter day. The temperature in Reykjavik was a crisp -6°C and following our arrival we had just 1 day to make final preparations and rush around town to secure any last-minute items (food, gas etc.). Whilst doing so we would occasionally be quizzed by friendly locals about what we were doing. Upon telling them our plans to camp out in the highlands for 9 days, over 100km away from civilisation, they all had the exact same reaction: "Are you crazy?!"

If the hardy Icelandic folk thought we were nuts then we truly must have been in for a wild time!

Our ride arrived the next morning, two normalish looking vehicles mounted on top of enormous off-road wheels and driven by two big, bearded vikings. We had chosen wisely it seemed.

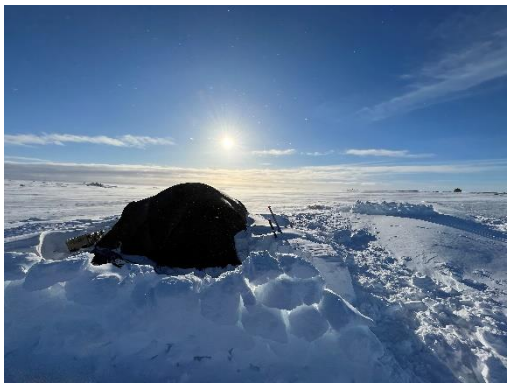
We had a very enjoyable drive through the Icelandic countryside and then into the frozen wilderness. While the early plan had been to ski tour the 8km from the F26 track to the field site, upon accumulating all the gear during planning, we quickly realised this would be a mammoth task and so thankfully the superjeeps said it wouldn't be a problem to try and drive us all the way to the site. Despite a nerve-wracking moment slowly crossing a large frozen river with the sounds of cracking ice all around us, we made it to the field site in one piece and began to setup camp as the super-jeeps drove off into the sunset, leaving us in a desolate icy landscape.



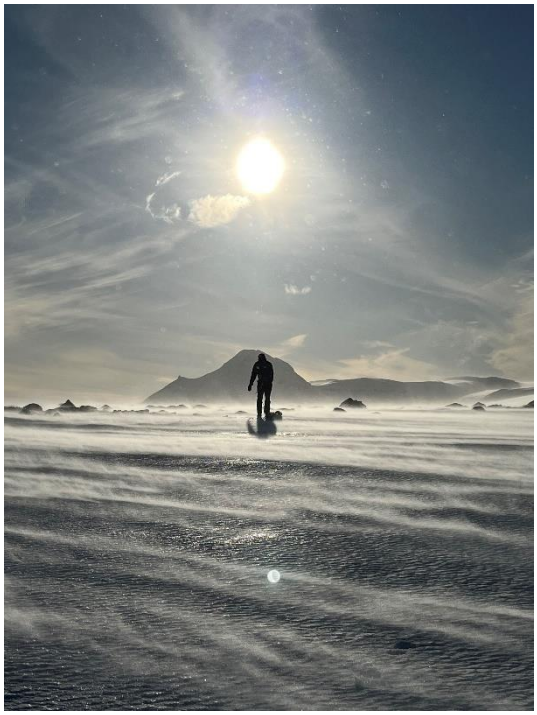
We were fortunate to experience lots of beautiful blue-sky weather, allowing us to get cracking with the surveying straight away. Despite bringing snowshoes and some touring skis, the ground around and on top of the ice cap was nicely frozen and wind scoured, allowing us to walk around quite freely in snowboots. Unfortunately, our primary GPR decided to stop working after the first day. This can be annoyingly common in remote and extreme fieldwork, so thankfully we had brought two other systems that we could continue to work with, albeit with slightly altered objectives.

After a couple of days of brilliant weather, one evening the wind suddenly switched on out of nowhere into a very strong and steady barrage at about 70km/h. This kicked us into action building some snow walls around the tents to act as a windbreak and try to reduce some of the force. By sunset it had also started to snow a bit and it goes without saying it was very frigid, around -20°C. Camping in such conditions is an interesting experience and you certainly learn quickly not to leave anything important outside of your sleeping bag unless you're ok with it freezing solid!

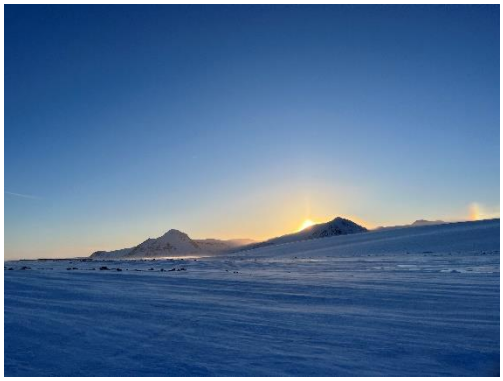
The next couple of days continued with some lovely sunny weather, but the wind persisted and made our work in the field rather exciting. Gradually our defensive snow block walls grew in size and large snow drifts formed in the gaps between them. Each morning we would spend a couple of hours digging out bits of the camp which had been buried in over a metre of drift. But spirits remained high as we continued to work and live in a really stunning and unique environment. Each hour the wind, sunlight and snow would coalesce in a new way to form a truly magic scene.



Given the remote location, we were under the impression that there would be no phone service, so had brought along a satellite phone and spot tracker for emergency use. As it turns out, a new phone mast had recently been installed on a mountain on the horizon, giving us a couple of bars of signal in places. This proved to be very valuable for checking the weather forecast and upon doing so one evening, we saw a large storm system was on its way for the following night, bringing with it 100km/h winds. Whilst we and the tents had just about managed in the previous night's high wind, Emma and Rebecca with their Antarctic experience felt that the tents might not survive this coming storm and that we risked quite a dangerous situation.



With the winds forecast to be extreme for the rest of the week, we therefore made the unfortunate decision to call the super-jeeps for an early pick-up about half-way through our planned time out in the field. Ironically the final day of work before the jeeps arrived in the late afternoon was the best day of weather with a clear, still sky (the calm before the storm?). It was sad to be leaving early, just as we had settled in to a routine and began to feel attached to our icy camp, but we had already accomplished most of our objectives and with the incoming weather too extreme to work in, it would have been pointless and reckless to stay. Rather fittingly I had just been reading a book from explorer Erling Kagge the night before, in which he writes: "Courage doesn't mean carrying on regardless of the consequences, because to be reckless is not to be brave. It's no shame to turn back, that's rule number eight of the Norwegian Mountain Code". So although it was a shame and felt a bit like giving up, even our Icelandic drivers told us we would have been in for a bad time and made the right call.



Ultimately, we've come away with some amazing data to work on and some even more amazing memories. It was truly special to spend time in such a beautiful and isolated environment and I can't wait to one day return. You can watch a short video of our expedition on YouTube here: https://t.ly/W2K8A.

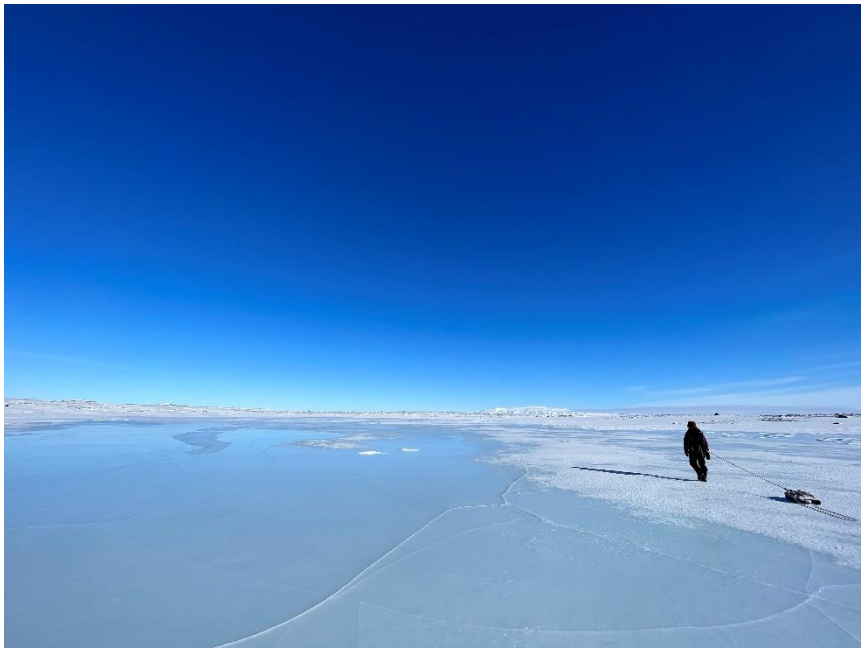


Photo Captions:

All photos taken by myself, Will Wenban.

Title_photo – Camp at the edge of the ice cap.

Photo_1 – Super Jeeps on top of the ice cap, a little joyride when we first arrived.

Photo_2 – Out surveying with the primary GPR which then broke.

Photo_3 – A rush to build defences as the strong wind blew in.

Photo_4 – One of many glorious mornings, note the build-up of snowdrift on the right of the tent.

Photo_5 – Pete fighting through the spin-drift and dragging the GPR behind.

Photo_6 – Sun, snow and sky continuously combine into stunning scenes.

Photo_7 – Rebecca returning to camp over one of the many frozen pro-glacial lakes.