

Ambassador Story

From high Himalayas to high Arctic



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Exploring Life at the Extremes

Our project, HIGHPLANTS, aims to connect two geographically distant but environmentally comparable cold deserts: the high-latitude Arctic and the high-altitude Himalayas. We want to investigate how plants survive and function under extreme environmental conditions by comparing their photochemical performance, functional traits, growth, and plant–microbial interactions. Through POLARIN, we conducted our field campaign at the northernmost research station, Villum Research Station (Station Nord), Greenland.

Why This Research Matters

Although the Arctic and high Himalayas are separated by thousands of kilometres, they share several environmental characteristics, including low temperatures, short growing seasons, strong seasonality, and high exposure to environmental stress. But rarely any study has done a direct comparison of plant functioning and adaptation. Therefore, HIGHPLANTS aims to bring the two cold deserts together and understand if the plant strategies are similar or differ. Additionally, such comparison is particularly relevant in the context of climate change when both ecosystems are experiencing rapid environmental changes, shifts in seasonal patterns, and more extreme weather events.



Working in the High Arctic

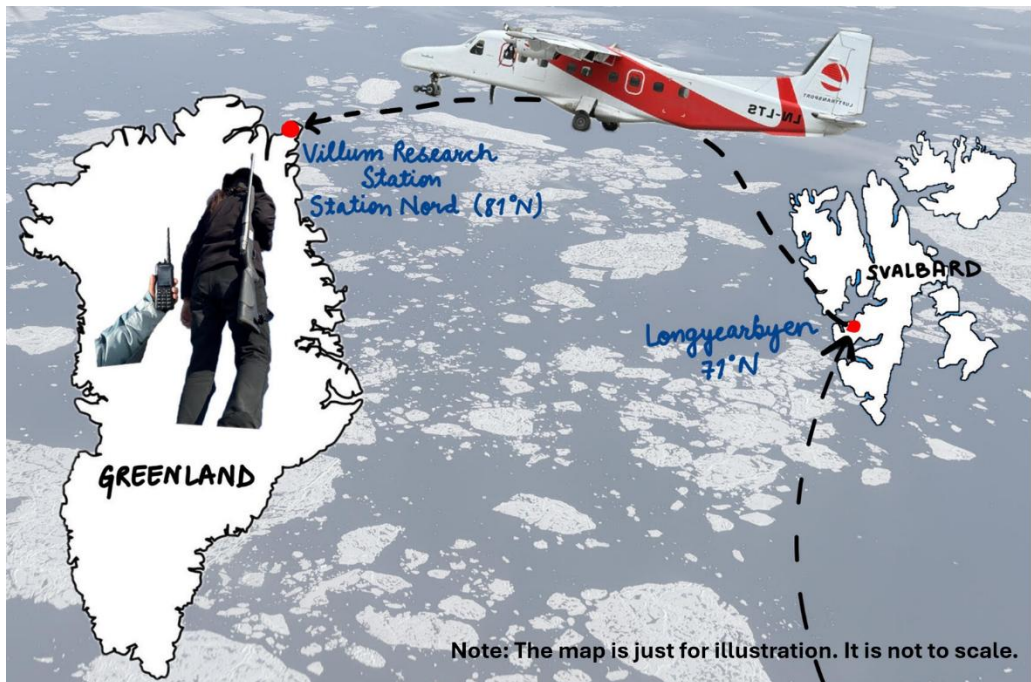
Our research group has extensive experience working in the high Himalayas in Ladakh, India, but we have never conducted field research in the high Arctic. For a long time, we wanted to study plants from the cold Arctic deserts and compare them with the plants from the Himalaya, which we know quite well. POLARIN enabled us to take this first step into Arctic research. The support was particularly valuable because Arctic fieldwork is logistically demanding, especially for researchers who are beginning to work in the region.

Our research was conducted in northeastern Greenland, at the Villum Research Station (VRS, Station Nord), one of the most remote research stations in the Arctic. POLARIN provided not only access to the research infrastructure, but also the logistical framework and support needed to make the field campaign possible. We worked closely with the station manager, Jørgen Skafte, to plan the campaign and coordinate transport, accommodation, safety procedures, field access, and other practical aspects of our stay. This close coordination made a potentially very complicated field campaign remarkably smooth.

Our POLARIN Field Experience (challenges and highlights)

The experience was positive, although Arctic fieldwork was quite different from our previous Himalayan expeditions in terms of logistical needs and weather uncertainties.

We first travelled to Longyearbyen in Svalbard and used a few additional days as a buffer in case weather conditions hampered our schedule. Fortunately, we were welcomed by exceptionally clear weather and were able to fly as planned. We travelled on a small, chartered aircraft and had the most surreal views of the Arctic landscape from the window, including vast ice sheets surrounded by an intensely blue ocean. Even the small on-board coffee-and-chocolate service made the journey feel special. Upon arrival at VRS, Jørgen Skafte introduced us to the station's rules, daily routines, safety procedures, and field protocols. Since we were in polar bear territory, we received polar bear safety training, including training with flare guns and rifles. Because the weather was exceptionally good when we arrived, we decided to begin the fieldwork almost immediately rather than wait. Another research group who was there before us had experienced a snowstorm only a few days earlier, which reminded us how quickly conditions can change in the Arctic.



The station itself is surrounded by a remarkably open polar desert landscape, with the sea visible on both sides of the peninsula. We were surprised by the diversity of plants around the station. As we moved towards the glacier and moraine, vegetation became increasingly patchy, with different areas dominated by species such as *Papaver radicum*, *Saxifraga oppositifolia*, *Dryas integrifolia*, and *Salix arctica* etc. During the campaign, we established vegetation plots along a transect from the station towards the glacier moraine, measured the photochemical performance of a few of the dominant plant species, and collected soil samples for microbial and physicochemical analyses. We were therefore able to sufficiently accomplish the main objectives of the field campaign despite the challenging weather.



What We Learned Along the Way

One of the most memorable aspects was simply learning to work according to the Arctic weather. During our first week, we were fortunate to have several days of clear weather and made the most of the almost continuous daylight. The midnight sun was particularly fascinating, and we found ourselves using the polar daylight to maximise our fieldwork. The second week showed us the other side of Arctic weather. We experienced blizzards, snowstorms and strong winds, which made the already muddy permafrost terrain even muddier. Eventually, the runway became too wet for aircraft to take off/land. At that point, checking the weather forecast became almost an hourly activity as we tried to work out when the next possible flight would be for us to fly back to our home Institute. This was a good lesson in Arctic fieldwork: one cannot simply follow a fixed schedule, one must instead adapt continuously to the environment.

Another memorable experience was the contrast between the Arctic and the Himalayas. After studying Himalayan cold deserts throughout my PhD, standing in the Arctic polar desert felt strangely familiar. The vegetation, open landscapes and environmental conditions had many similarities, even though the Arctic desert is considerably wetter than the high-altitude deserts of the Himalayas.

We also saw evidence of the larger Arctic wildlife around the station, including musk ox bones. We did not, fortunately or unfortunately, spot any



polar bears and did not have to use our rifles/guns.

Advice for Future POLARIN Researchers

POLARIN offers much more than access to a research station. For an early-career researcher, it is also an opportunity to gain first-hand experience in planning and managing a field campaign in a remote location, coordinating logistics, organizing research activities under uncertain environmental conditions, preparing data-management plans, and handling reporting and project coordination. For me, after years of studying the high Himalayas for my PhD, being able to work in the High Arctic and see these two extreme environments side by side was both scientifically exciting and personally very meaningful.



Now we are back at our home institute and looking ahead to the sample processing, analysis, and data curation...until we can share with you all what we discovered from this campaign.

HIGHPLANTS research team:

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