

# Martian drill set for Antarctic climate mission

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A drill originally developed to break through Martian rocks is set to be deployed to Antarctica on a mission which could help us understand the history of Earth's changing climate.

A team of University of Glasgow engineers are heading to a British Antarctic Survey (BAS) [research station](#) named Skytrain Ice Rise on Thursday 3 January with a sophisticated [drill](#) they originally developed for use on future unmanned Martian rover missions.

Current drill technology requires considerable downward force in order to drive the [drill bit](#) through rock, a considerable challenge in lower-gravity environments such as the surface of Mars.

The Glasgow engineers' drill overcame that issue, which allowed the whole system to be made much smaller. That, in turn, made it ideal for sending down the long, narrow boreholes drilled by ice-cutting systems in Antarctica, where it aims to collect a sample of rock from the very bottom of the ice sheet.

The team has worked with BAS on several occasions to test their space drill systems in the cold, dry, and rocky Antarctic, one of just a handful of places on Earth whose landscape is similar to that which might be found on Mars.

On this visit, their aim is to test the effectiveness of their drill technology for a new, more terrestrial purpose. Samples of bedrock,

from several hundred metres under the ice, will be recovered and shipped back to the UK for analysis.

Here, scientists will measure the build-up of radioactive isotopes in the rock, the accumulation of which is governed by exposure to sunlight. The isotopes' relative abundance can be used as a kind of 'rock clock', allowing researchers to determine how long ago the rock was covered by ice sheet, and therefore when – and how often – the ice has receded in the past.

Dr. Patrick Harkness of the University of Glasgow leads the team of engineers which developed the drill. He said: "We've worked closely with the British Antarctic Survey in the past to test our Martian drill and we're really excited to be working with them again this winter.

"We're hoping to get a sample of bedrock out from underneath the Antarctic ice sheet and return it to the UK for analysis. When we do that we'll be able to determine how long it's been since that rock last saw the sun and that information will allow us to recreate the advance and withdrawal of the ice sheets, which gives us much greater information about the coming and going of ice ages.

"That could allow us to validate our climate models with much greater confidence and make better decisions about environmental matters here on Earth."

Provided by University of Glasgow

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