2.7-million-year-old ice core pulled from Antarctica

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A team of researchers from Princeton University, the Scripps Institution

of Oceanography, the University of Maine and Oregon State University has drilled and retrieved a 2.7-million-year-old ice core from a spot in Antarctica. The team presented their findings at this year's Goldschmidt Conference in Paris.

Until recently, scientists believed that ice core samples taken from either pole had an age limit of approximately 800,000 years—this was because ice at the bottom melted due to heat from inside the Earth. But a team at Princeton discovered a few year ago that another type of ice could hold much older ice known as blue ice. It forms on glaciers due to snowfall which, over time, becomes compressed, squeezing out air bubbles, making the ice look blue. But it also has another characteristic—over time, the ice at the bottom is pushed upwards, protecting it from melting. In this new effort, the team drilled at a site called the Allan Hills, near McMurdo Station.

Ice cores taken from glaciers present problems because they are more difficult to date—cores from other places are dated by counting their layers. The older ice, it was found, could be dated by studying trace amounts of potassium and argon—though not as precise as layer counting, the researchers believe it is accurate to within 100,000 years. One of the first teams to take a core sample from the older ice drilled to a depth of 128 meters. In this latest effort, the team drilled to 205 meters and found ice that was nearly twice as old.

Ice cores are important because they contain very small air bubbles that are samples of atmospheric conditions. Air bubbles from 2.7 million years ago offer evidence of climactic conditions during the time before the ice ages began, perhaps offering clues as to why they occurred. Already, the team has found that atmospheric carbon dioxide levels were at approximately 300 ppm, which is considerably lower than today's 400 ppm. But the team notes that the core sample represents something perhaps even more exciting—the possibility of finding core samples that

are much older, perhaps as old as 5 million years.

More information: Paul Voosen. 2.7-million-year-old ice opens window on past, *Science* (2017). DOI: 10.1126/science.357.6352.630