PAIRED TEXT

ESSENTIAL ENGINEER: Richter hauled tanks of liquid helium to BICEP2. The coolant kept the telescope working.

BIG BANG HERO

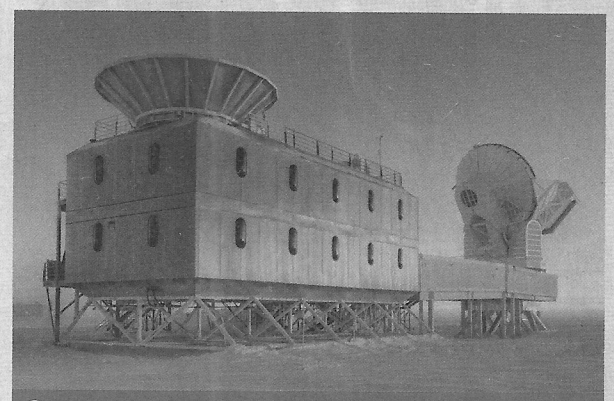
Steffen Richter overwintered in Antarctica to get vital data

Scientists recently announced that the BICEP2 telescope at the South Pole may have detected a signal from the birth of the universe—the *big bang*. The research couldn't have been done without Harvard University electronics engineer Steffen Richter, who spent three winters in Antarctica keeping the telescope running. He worked in temperatures below -58°C (-72°F) and had no way to get off the icy continent. Harsh weather conditions prevent planes from flying to or from Antarctica for nine months straight.

—*Jennifer Barone*

What was your job at the South Pole station? I was in charge of maintaining BICEP2. At least once a day, I'd walk about three quarters of a mile from the main research station to the telescope. I'd make sure the data were flowing OK. I'd also remove snow around the telescope.

BICEP2 needed to be cooled to very low temperatures to be able to detect the faint signal. So a big part of my job was to keep the telescope cold: -270°C (-450°F). To do this, I'd pour *liquid helium*, a coolant, into the telescope every three days.



AT THE BOTTOM OF THE WORLD: The BICEP2 telescope takes advantage of clear skies at the pole.

Did the telescope ever run into problems? Sometimes there were minor glitches, so I would do repairs. You have to keep lots of spare parts at the station, since there's no way to get anything once the last airplane has left for the winter. But we designed the telescope to run in this environment, so surprisingly little goes wrong most days.

What's it like to live and work at the South Pole? For me, it's a dream job. I'm involved in groundbreaking science, right at the frontier, and it's an adventure. I love seeing the stars and the *aurorae*, or southern lights. It's beautiful.

What would you tell a student who wants to work at the South Pole? A lot of people in the U.S. Antarctic Program start out shoveling snow or washing dishes—jobs where you just need a lot of energy and a good attitude. And Antarctica is like a huge playground for science: There's climate monitoring, marine science, geology. There's so much to discover.