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Canadians won't have to travel too far to touch the Earth's oldest rocks. New research has discovered that rocks (shown) as old as 4.28 billion years are found along the eastern bank of Hudson Bay in northern Quebec in an area known as the Nuvvuagittuq greenstone belt. THE CANADIAN PRESS/HO-McGill University-Jonathan O'Neil

## Oldest rocks on Earth found in Quebec, researchers report

3 days ago

MONTREAL — The discovery that a section of bedrock in an Inuit village in northern Quebec may be as old as 4.28 billion years sheds more light on our continent's mysterious beginnings and may provide the first traces of life on Earth, researchers said Thursday.

The Earth's oldest rocks are located along the eastern bank of Hudson Bay in northern Quebec in an area known as the Nuvvuagittuq greenstone belt.

While the rocks were discovered seven years ago, it was only last spring that a group of scientists from McGill University, the University of Quebec in Montreal and the Carnegie Institute for Science in Washington D.C. were able to put a date on them.

"First when we got these results we didn't really believe it," Jonathan O'Neil of McGill's department of earth and planetary sciences said in a phone interview.

"We reanalyzed the rocks and then said 'Wow, it must be true.' We keep getting the same results," said the 29-year-old researcher from Dunham, Que.

While the age of the Earth itself is estimated at 4.6 billion years, most of the original surface has been crushed and recycled through the movement of giant tectonic plates across the planet's surface. This discovery pushes back the age of most ancient remnants of Earth's crust by 300 million years.

"Geologists now have a new playground to explore how and when life began, what the atmosphere may have looked like and when the first continent formed," O'Neil said.

By measuring tiny variations in the chemical composition of the Nuvvuagittuq greenstone, the researchers were able to date various rock samples to between 3.8 billion and 4.28 billion years ago.

O'Neil spent the last four years studying the Nuvvuagittuq greenstone, especially one specific type of rock in the belt that the scientists decided to call "faux-amphibolite", for it was a very unusual rock.

"It turned out that we got an age of 4.28 billion years for that specific rock, which makes it the oldest portion of continent that we can find at the surface of our planet," O'Neil said.

Researchers used isotopic dating, a new dating technology previously used to date meteorites, which analyzes the decaying of a radioactive material contained within the rock. The technology can only be used to date rocks that are 4.1 billion years old or older.

"The data from these findings will give researchers a new window on the early separation of Earth's mantle from the crust in the Hadean Era," said O'Neil.

One of the findings already puzzling researchers is the discovery of a type of rock that would need an ocean to form.

O'Neil said the discovery would imply that a shallow ocean already existed 300 million years after the Earth's formation.

He said that a lot of geologists think that bacteria, or bugs are needed to precipitate the iron from the ocean to form this type of rock.

"So if that's the case, and I say IF that's the case, it could actually be the earliest traces of life on the planet."

Many questions remain as to whether the whole formation is 4.28 billion years old or whether it is a younger belt made of older rocks.

One thing is for sure. The Inuit village where the bedrock is located is likely to become the Mecca of the world's geologists.

"I'm pretty sure now it's going to be a very, very busy place," said O'Neil, adding that the

team of scientists is grateful for all the support of the Inuit community.

"They're pretty proud to have in their backyard actually the oldest rock on the planet."

Asked about how he felt working at the site of the Earth's oldest rock, O'Neil took a deep breath and then said:

"You're just walking on this first piece of continent and you can just imagine yourself 4.3 billion years ago."

"It just feels awesome."

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