

Researchers suggest missing crust layer can be blamed on 'Snowball Earth'

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An international team of researchers has found evidence supporting a theory that suggests a missing crust layer can be blamed on "Snowball Earth." In their paper published in *Proceedings of the National Academy*

of Sciences, the group describes the evidence they found and why they believe it supports their theory.

Earth scientists have debated the reason behind what they describe as a missing crust [layer](#) for over a century—in 1869, geologists noted that there appeared to be a missing layer of rock in the Grand Canyon. Samples showed a layer dating back 540 million years, and directly below it, a layer that was dated to 1 billion years ago. This posed the question: What happened in-between? That gap has been observed in other places on Earth, and has been named "the Great Unconformity." To explain the gap, scientists developed two theories—either there was a dramatic increase in sedimentation, or there was a large and rapid erosion event. In this new effort, the researchers claim to have found evidence that supports the latter theory.

The researchers suggest that the large erosion event was the development of what has been termed "Snowball Earth"—a period when the entire planet was completely covered with ice. They believe that as the ice receded, it took a whole layer of the crust with it, dumping it into the sea. If that was the case, logic suggests, testing the seafloor should show a large layer of rock from that time period. But no such layer has been found. The researchers suggest this is because the rock was pulled into the Earth's interior by the movement of the tectonic plates occurring at the time.

The evidence for this theory came in the form of crystals from the period in question—the researchers had isotopes of hafnium and oxygen that were consistent with such crystals that have undergone erosion under cold conditions. The data came from a database of information on 30,000 zircon crystals. The researchers note that [radioactive isotopes](#) can serve as time keepers.

More information: C. Brenhin Keller et al. Neoproterozoic glacial

origin of the Great Unconformity, *Proceedings of the National Academy of Sciences* (2019). [DOI: 10.1073/pnas.1804350116](https://doi.org/10.1073/pnas.1804350116)

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