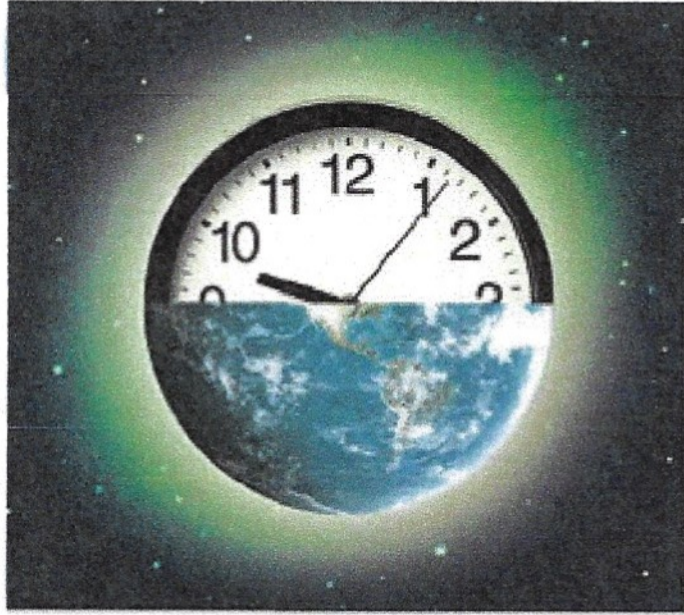


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A Day on Earth Is Getting Longer as The Planet's Rotation Slows

SCIENCE SHORT

A change of milliseconds seems insignificant, but it can cause problems for our clocks, GPS and navigation apps, and satellites

BY AYLIN WOODWARD

EVER FEEL LIKE the days are dragging on longer? Turns out you're right.

We think of a day as 24 hours, but recent research indicates that days are lengthening—ever so slightly. Over the past two decades, day length grew by a rate of about 1.33 milliseconds per century, according to a study published in the Journal of Geophysical Research: Solid Earth.

The change is happening because the Earth's rotation is slowing down. The culprit? Melting ice.

As temperatures warm, ice in the Arctic, Greenland and Antarctica melts. The newly liquid water shifts away from poles and into the ocean. The resulting rise in sea levels changes the speed at which the planet rotates.

To understand why, think about figure skaters in a spin. When they pull their outstretched arms into the center of their bodies, they spin faster. That's because the speed of an object's rotation is influenced by its mass and where this mass is, said study co-author Benedikt Soja, a geoscientist at ETH Zürich in Switzerland.

If the mass is farther away from the object's rotational axis—imagine a string running between Earth's north and south poles—the rotation slows.

“We think we always have the same length of day, but with precise measurements we see that's not the case,” he said.

This finding suggests Earth's days will eventually be longer than 24 hours, but that process will take millions of years, said study co-author and University of Vienna geoscientist Mostafa Kiani Shahvandi. The researchers calculated that the slowdown is happening at a rate unprecedented in 3.6 million years.

Experts can calculate the Earth's rotation today with satellites and other techniques that measure the planet's movement. But to calculate this rotation millions of years ago, the study authors examined the chemical composition of fossils of

ancient seafloor organisms that built their shells out of chemicals in the seawater. Changes in these chemical fingerprints corresponded to changes in sea levels, which the scientists used to extrapolate day lengths.

A change of milliseconds seems insignificant, but it can cause problems for our clocks, GPS and navigation apps, and satellites that rely on accurate information about Earth's rotation.

The slowing of Earth's rotation isn't something that can be undone, said Soja. Continued changes to the climate will likely cause bigger changes to day length by the end of the century, he added.

"We can slow down this trend, but we cannot really reverse it as of now," Soja said.

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