# Earth was born with water as primordial ingredients contained hydrogen, scientists discover



Scientists have made a significant breakthrough in understanding the origin of water on Earth, challenging the long-standing theory that the planet’s water was delivered by asteroids during its early history. Researchers from the University of Oxford have uncovered evidence suggesting that Earth was likely "born with" the ingredients for water, implying that liquid water may have been present from the very formation of the planet more than 4.55 billion years ago.

This new insight centres on a rare type of meteorite known as an enstatite chondrite, specifically a specimen labelled LAR 12252. These meteorites are believed to be composed of the primordial material that formed early Earth. Using a powerful X-ray beam to analyse the rock, the research team detected high concentrations of hydrogen sulphide embedded within the meteorite. Crucially, this hydrogen sulphide was not introduced after the meteorite landed on Earth but was an intrinsic part of the rock itself, indicating that the early building blocks of our planet were already rich in hydrogen.

Tom Barrett, a DPhil student in the Department of Earth Sciences at the University of Oxford and the lead author of the study, commented on the findings, saying: “We were incredibly excited when the analysis told us the sample contained hydrogen sulphide – just not where we expected!” He added, “Because the likelihood of this hydrogen sulphide originating from terrestrial contamination is very low, this research provides vital evidence to support the theory that water on Earth is native – that it is a natural outcome of what our planet is made of.”

For many years, the prevailing scientific explanation held that Earth’s water arrived later during a tumultuous phase known as the "late heavy bombardment," when the young planet was incessantly struck by asteroids and comets, delivering water and other key ingredients for life. However, the new findings suggest that Earth’s initial formation materials may have already contained sufficient hydrogen for water to exist from the outset. While asteroids may still have played a role in adding to Earth’s water supply, it may not have been necessary to bring it all.

Associate Professor James Bryson, a co-author of the study from the Department of Earth Sciences at Oxford, explained the broader implications of the discovery: "A fundamental question for planetary scientists is how Earth came to look like it does today. We now think that the material that built our planet – which we can study using these rare meteorites – was far richer in hydrogen than we thought previously.” He continued, “This finding supports the idea that the formation of water on Earth was a natural process, rather than a fluke of hydrated asteroids bombarding our planet after it formed.”

The research not only revises theories about Earth's formation and the origins of its water but also has wider implications for understanding how water and potentially life-supporting conditions might arise on other planets throughout the Universe.

Professor Bryson also noted the robustness of the evidence, stating to MailOnline, “We are pretty confident that the meteorites we have measured are a good representation of Earth's building blocks,” due to the meteorite’s elemental stable isotope ratios mirroring those found in Earth’s interior.

This breakthrough study thus transforms the scientific narrative about the emergence of water on our planet, highlighting a more intrinsic origin tied to Earth’s primordial materials rather than external delivery by cosmic impacts.

Source: [Noah Wire Services](https://www.noahwire.com)