

The Moon, our planet's constant companion for some 4.5 billion years, may have been forged by a rash of smaller bodies smashing into an embryonic Earth, researchers said Monday.

Such a bombardment birth would explain a major inconsistency in the prevailing hypothesis that the Moon splintered off in a single, giant impact between Earth and a Mars-sized celestial body.

In such a scenario, scientists expect that about a fifth of the Moon's material would have come from Earth and the rest from the impacting body.

Yet, the makeup of the Earth and the Moon are near identical—an improbability that has long perplexed backers of the single-impact hypothesis.

"The multiple impact scenario is a more 'natural' way of explaining the formation of the Moon," said Raluca Rufu of the Weizmann Institute of Science in Rehovot, who co-authored the new study published in the journal *Nature Geoscience*.

Such multiple hits would have excavated more Earth material than a single one, which means the moonlets would more closely resemble our planet's composition, said the study authors.

Rufu and a team created nearly a thousand computer simulations of collisions between a proto-Earth and embryonic planets called planetesimals, smaller than Mars.

Every collision would have formed a disk of debris around the proto-Earth which would, in turn, clump together to form a "moonlet", they found.

Moonlets would eventually coalesce to form the Moon.

"In the early stages of the Solar System, impacts were very abundant, therefore it is more natural that several common impactors formed the Moon rather than one special one," Rufu told AFP.

Discarded theory revived

Our Solar System is thought to have formed 4.567 billion years ago, followed by the Moon about 100 million years later.

Numerous "impactors" would have excavated more Earth material than a single one, which means the moonlets would more closely resemble our planet's composition, said the study authors.

About 20 such crashes would have been required to build the Moon, they concluded, while conceding that further study is needed into the mechanics of Moon formation from "moonlets".

The giant-impact hypothesis was first proposed in the mid-1970s, followed in the 1980s with the first suggestions that several collisions may have given the Earth its tide-creating satellite.

The latest study has "revived the hitherto largely discarded scenario that a series of smaller and more common impacts, rather than a single giant punch, formed the Moon," Gareth Collins of Imperial College London wrote in a comment carried by the journal.

"Building the Moon in this way takes many millions of years, implying that the Moon's formation overlapped with a considerable portion of Earth's growth," he added.

More information: *Nature Geoscience*,

[nature.com/articles/doi:10.1038/ngeo2866](https://doi.org/10.1038/ngeo2866)

© 2017 AFP

Citation: Study crashes main Moon-formation theory (2017, January 9) retrieved 18 April 2024 from <https://phys.org/news/2017-01-main-moon-formation-theory.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.