



Morning Edition

August 17, 2011

Early Earth May Have Been Orbited By Two Moons

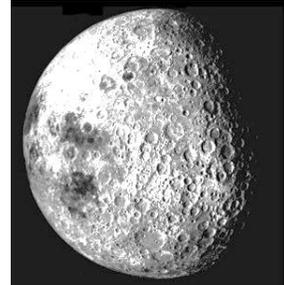
Heard on Morning Edition

August 4, 2011 - STEVE INSKEEP, host:

It's MORNING EDITION from NPR News. I'm Steve Inskeep.

RENEE MONTAGNE, host:

And I'm Renee Montagne.



Our planet has made the most of its one moon in a solar system where others have far more. Jupiter has dozens. Earth's lone, silvery moon has managed to inspire lovers and poets for pretty much all of human history. Turns out, though, way back, Earth may have had two moons. NPR's Nell Greenfieldboyce reports that's a new theory scientists have come up with to explain an old mystery.

NELL GREENFIELDBOYCE: Earth has only one moon. And from Earth we see only side of it - the near side. But when space probes and astronauts got to circle the moon, they saw its far side. And it looked unexpectedly different. The surface of the near side is low and flat. The far side is mountainous, and deeply cratered.

Erik Asphaug is a planetary scientist at the University of California, Santa Cruz. He was recently pondering this lunar asymmetry.

Dr. ERIK ASPHAUG (University of California, Santa Cruz): I thought, well, you know, what about just something colliding with the moon, in such a manner that it didn't form a crater, but it just made a big splat?

GREENFIELDBOYCE: What could go splat against the far side of the moon? Well, how about another moon? Researchers believe that our moon formed after a giant object the size of Mars smacked into the early Earth, spewing out debris. That debris orbited our planet and coalesced to form the moon. But Asphaug says it could also have formed smaller leftover moons.

Dr. ASPHAUG: Our theory begins with this notion that there was one, or maybe a few, leftovers trapped at stability points in the Earth-moon system known as the Lagrange Points. And one of these, the biggest of these, goes unstable and crashes into the moon.

GREENFIELDBOYCE: Asphaug and a colleague did computer simulations of that crash. Their calculations showed it would occur almost in slow motion and wouldn't carve out a crater. Instead, rocky rubble would be strewn across the far side of the moon

Dr. ASPHAUG: And what you're seeing when you look at the lunar far side, if our theory's right, is you're actually seeing the sister moon that collided with the moon and pasted itself, kind of like a mud clod thrown at a wall.

GREENFIELDBOYCE: If all this is true, then for tens of millions of years before the collision the nighttime skies above the Earth would have looked very different.

Dr. ASPHAUG: The picture you have just prior to this event is a couple of moons in the sky - our moon that we know and love and a sister moon that's no longer there. And these would rise and set every day just like our moon does, but you'd have a couple of them.

GREENFIELDBOYCE: No one would have seen this strange picture. All of these events occurred before the dawn of life. The young Earth was still basically molten.

The new theory is described in the journal Nature and it's impressed Maria Zuber. She's a planetary scientist at the Massachusetts Institute of Technology in Cambridge. She says, normally, scientists assume that collisions produce craters - big holes. These new simulations show that under the right conditions, an impact can create mountains.

Ms. MARIA ZUBER (Massachusetts Institute of Technology): I think this idea is going to get a lot of attention, because it's very novel, it's very clever, and people are going to be interested in testing to see whether it's right or wrong.

GREENFIELDBOYCE: Zuber is head of a NASA mission called GRAIL that will launch next month, to orbit the moon and take measurements that will reveal its inner structure. That could provide additional clues about whether part of our moon is actually made of a smaller companion that went splat.

Nell Greenfieldboyce, NPR News.

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