The Moon is hypothesized to have been created from a large impact late in the Earth's formation. The currently accepted hypothesis is that a Mars-sized proto-planet catastrophically impacted the proto-earth. The material that was ejected during the collision and traveled fast enough to orbit but not fast enough to escape formed a debris disk orbiting the Earth. The slow-traveling material fell back to Earth and remained, forming an Earth more similar to that of today. This disk then consolidated to form the moon over a timescale of thousands of years.

There are still some remaining questions about the Moon’s origin, including why its isotopic signature is so similar to the Earth’s. The angular momentum of the system is calculated, as well as the mixing ratio of the material in the disk to determine how much of the material comes from the Earth as opposed to from the impacting body. The impact parameter, mass of the Earth, and mass of the impactor are all then adjusted based on the results of previous collisions to form a more accurate simulation.

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