

Ask an Astronomer

Question: "Why doesn't the Moon fall down?"

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DORIS DAOU:

Actually, the Moon is always falling toward the Earth, but it's moving so fast that it will never hit.

When we throw an object like this tennis ball, gravity pulls it down towards the center of the Earth.

Even the fastest-moving tennis ball will eventually hit the ground.

But as objects get farther away and start moving faster, things change.

The Moon is so far away and moves so fast, that "down" is never in the same direction. Even though it's constantly falling, the Moon never hits the Earth. Instead, it falls around the Earth in a continuous circular path.

If the Moon were moving a lot faster it would escape Earth's gravity and fly off into space. If the Moon were moving more slowly, gravity would pull it down to the Earth.

This delicate balance of speed and gravity creates what we call an "orbit," where a smaller body circles around a larger one continuously. The Moon orbits around the Earth this way, just as Earth and the other planets orbit around the sun.

Most man-made satellites orbit the Earth. However, some are launched beyond the Earth's gravity so that they orbit the Sun instead.

For "Ask an Astronomer," I'm Doris Daou of the SIRTf Science Center.