

Ask an Astronomer

Question: "What happens when galaxies collide?"

segment number: 2007-002

Varoujan Gorjian:

Galaxies are made mostly of stars and gas. But when galaxies collide, the stars and the gas do very different things.

In a typical spiral galaxy, for example, there might be about 100 billion stars. But if two spiral galaxies collide, it's very unlikely that any of those stars will collide. That's because there's so much space between stars that the chances of a collision are, well, astronomical.

But the gas in galaxies, that is a different story.

The gas in a typical galaxy is spread out, like clouds in our atmosphere. These vast clouds don't miss each other like stars do. Instead, they smash together with tremendous force. This force compresses the clouds, and causes hydrogen atoms to clump together and form new stars.

But galaxies colliding isn't just an orderly crossing of stars and the creation of new ones. Gravity plays a very large role in a collision.

Much like the gravity of the moon causing tides on the Earth, during a collision, galaxies are stretched out in a process called "tidal disruption," creating these dramatic "tidal tails."

Interacting galaxies may pass through each other many times before they finally settle down into a new, larger galaxy.

In fact, our own Milky Way Galaxy is interacting with the nearby Andromeda Galaxy, and in about 3 billion years, they're going to start to merge, too.

For "Ask an Astronomer," I'm Varoujan Gorjian for NASA's Jet Propulsion Laboratory.