Ask an Astronomer

Question: "Where is the center of the Universe?"
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This may seem like a simple question. Since the Universe is expanding, it would seem logical that it was expanding away from a particular point. But, the Universe doesn't actually work like that.

The Big Bang, which started the expansion of the Universe, isn't like a firecracker explosion where there is a boom and all the pieces go flying apart from a single point. The Big Bang was in fact the creation of matter and space. And it is this space that's expanding.

Think of space as if it's a sidewalk with people standing on it. The expansion of the Universe isn't the people walking away from each other, but it's more like the sidewalk is spreading and moving the people apart.

As a simpler example, let's take the surface of a balloon. We can draw galaxies on it, but notice that no galaxy is at the center of the surface. When we blow up the balloon, all the galaxies spread apart from each other.

If you look at any single galaxy, all the other galaxies seem to be spreading away from it. Every galaxy sees itself as the center of the expansion. But since not every point can be the center, that really means there is no center.

The more space there is between any two galaxies, the more the expansion will be pushing those galaxies apart. So the further away one galaxy is from another, the faster it will be expanding away from it.

This discovery was made in 1929 by Edwin Hubble, who discovered that further away a galaxy is, the faster it was receding from us. And that's now known as The Hubble Law. The rate of expansion of the Universe is now known as The Hubble Constant.

So, even though it looks like we're at the center of the Universe, the Universe doesn't actually have a center.

For "Ask an Astronomer," I'm Dr. Varoujan Gorjian for NASA’s Spitzer Science Center.