

A Ridiculous Theory of Dark Energy

What does it mean to say that the entire universe is expanding? The whole universe can only be getting bigger, in any real sense, relative to some other reference frame. Expansion is not a meaningful concept without a reference frame relative to which the expansion occurs. It is common for nonscientists to immediately recognize this problem when they ask, “What is the universe expanding into?”¹

At the most basic level, there are two theoretical models of the universe: infinite and finite.² Both models struggle, in their own way, to explain the universe’s expansion.

In infinite models of the universe, the expansion we observe only applies to our portion of infinity. Within this infinite space, there might be an endless profusion of other universes, all of them expanding relative to an infinite reference frame.³ The question, “What is the universe expanding into?” is therefore not answered so much as it is excused. The problem of the whole universe getting bigger is absolved of its problematical nature. Even though the universe is expanding, it is not getting bigger in any real sense, because the universe is infinite.

Finite models of universe, on the other hand, immediately face the problem of an inconceivable edge of the universe itself. Scientists typically address this problem by theorizing a fourth spatial dimension. The analogy of a sphere is often used. A sphere is a three-dimensional shape whose two-dimensional surface has no edge. Finite models of the universe propose that the entire known universe is like the surface of a sphere. The three-dimensional universe would have no edge if it formed another type of sphere in a fourth dimension. As the three-dimensional universe expands, its four-dimensional shape grows in volume in the fourth dimension.⁴

But consider what it means to say that the entire universe has shape. The whole universe can only have shape, in any real sense, relative to some other reference frame. Shape is not a meaningful concept without a reference frame relative to which the shape takes its form.⁵ If the universe is shaped like a sphere relative to the fourth dimension, is the fourth dimension infinite, or does the fourth dimension itself have an edge? Ultimately, finite models of the universe can only extend the problem of an edge to another dimension. The question, “What is the universe expanding into?” is therefore only answered with a temporary stopgap. Finite models of the universe are perpetually undermined by an infinite regress in perspective.

At the most basic level, the fact that the universe is expanding destabilizes both infinite and finite models of the universe. It is difficult to overstate the crisis in our theoretical picture of reality. Infinite models can only excuse the universe’s expansion as a provincial phenomenon, while finite models can only push away the inconceivable edge of the universe to another dimension. If a scientist chooses to interpret the expansion of the universe as a simple fact—in other words, if the whole universe is actually getting

bigger—it becomes impossible to conceptualize how the universe could be either infinite or finite.

This crisis in the structure of our theories is occurring at the most basic level of analysis. The only way out, therefore, is to reconsider the basic logic of an expanding universe. The fact that the universe is expanding is actually only half of the fact in question. The other half of the fact—the reference frame relative to which the universe expands—must also be accounted for in order to arrive at any picture of reality that is logically coherent. In short, the fact that the universe is expanding compels us toward a concept of *that which is not the universe*; the fact that the universe is expanding implies the existence of an entirely different aspect of reality.

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- [1] Siegel, Ethan. “What is the Universe Expanding Into?” *Forbes*, 19 Feb 2016, <http://forbes.com/sites/startswithabang/2016/02/19/what-is-the-universe-expanding-into/#4dd48d6841a4>
- [2] Cain, Fraser. “What is the Universe Expanding Into?” *Phys.org*, 28 Nov 2013, <http://phys.org/news/2013-11-universe.html>
- [3] Scoles, Sarah. “Can Physicists Ever Prove the Multiverse Is Real?” *Smithsonian*, 19 April 2016, <http://smithsonianmag.com/science-nature/can-physicists-ever-prove-multiverse-real-180958813/>
- [4] Cain, Fraser. “What is the Universe Expanding Into?” *Phys.org*, 28 Nov 2013, <http://phys.org/news/2013-11-universe.html>
- [5] Moreover, to claim that the entire universe has a shape is to claim that shape is a higher category than reality itself. And to make the further claim that there is no reference frame relative to which the shape of the universe takes its form is to claim that the shape of the universe is an absolute reality, a mysterious end of all inquiry. It is to claim, in effect, that God is a shape—a tragicomical end to this system of thought.