

A Critique of Shortsighted Anthropic Principles

Many people marvel that we live in a universe that seems to be precisely tailored to suit the development of intelligent life. The observation is the basis for some forms of "Anthropic Principles" that strive to explain why the laws of physics take the form we observe, given the nearly countless other possibilities permitted by schools of thought such as string theory.

But a new paper in *Physical Review Letters* from a group of physicists at Case Western Reserve University argues that any connection between the laws of physics and the existence of life is likely to be an illusion stemming from our shortsighted definition of intelligent life.

For the sake of their analysis, the authors define intelligent life as any organism capable of producing scientists who can observe the universe around them. They then consider three types of universes: those that don't lead to scientists, those that lead to scientists who are completely different from us, and those that lead to scientists who need the same physical laws to survive that we require.

According to the authors, the second type of universe - one populated by scientists entirely unlike us - is too often overlooked by those who turn to anthropic arguments. After all, for all we know life could be very common in many types of universes even if stars and the other familiar components of our universe don't exist.

At best, it seems that our existence may indicate that the laws of physics as we know them are in effect - leading to a sort of litmus test for our type of physics that goes "where scientists similar to us exist, the laws of physics must be like ours." On the other hand, it's possible that our existence proves nothing more than the fact that intelligent life and the physics in our universe are simply not mutually incompatible - a conclusion that the authors describe as "nice, but hardly surprising."

The paper implies that the anthropic claim that "we observe things the way they are because otherwise we wouldn't be here to see them" should take a back seat to the search for fundamental explanations for why our physical laws must be the ones we have.

Source: American Physical Society

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