

WHY IS THE UNIVERSE FINE – TUNED FOR LIFE ?



What "fine-tuning" means

IT'S LIKE A RECIPE FOR A CAKE

A recipe is fine-tuned to produce a certain type of cake. In physics, “fine-tuning” means that for life to exist in our universe, the ingredients (fundamental constants) and conditions that cooked up our universe had to be just so.

Our universe is delicately balanced

TAKE GRAVITY, FOR INSTANCE

If gravity made you just one billionth gram heavier or lighter, no stars, no galaxies, and no planets could form. No planets mean no you. There are a lot of examples like this.



The argument has three parts

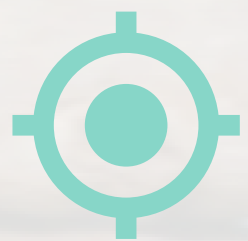


THE ARGUMENT IS VALID

(1) The fine-tuning of the universe is due to either **physical necessity, chance, or design**. (2) It is not due to physical necessity or chance. (3) Therefore, it is due to design.

But is it sound?

WHAT ABOUT CHANCE?



The odds are astronomical that **all** the cosmological constants would have the precise values that they do. It would be like standing before a firing squad of 100 marksmen and all of them missing. Maybe that's chance, but **design** is more likely.

But what about the multiverse?



THREE FACTS ABOUT THE MULTIVERSE

- 1) The multiverse is a hypothesis, not a scientific fact.
- 2) If a parallel universe exists, it would not be observable from ours.
- 3) If the multiverse exists, it would require fine-tuning itself.