

Scientific paradoxes

Created by: Xinyu Lin

Introduction

Scientific paradoxes are among the most captivating aspects of science. They push the boundaries of our intuition and understanding, compelling us to reconsider the mysteries of the natural world. On this poster, we will explore some perplexing scientific questions and how they have ignited the development and exploration of science.

Examples of Scientific paradoxes

Time travel paradox



If a person goes back in time and kills his grandfather, then that person will not be born, but if that person does not exist, how can he go back in time and kill his grandfather? The time travel paradox involves Einstein's theory of general relativity, which is the theory describing gravity. According to this theory, matter and energy bend spacetime, thereby influencing the passage of time.

The time travel paradox prompts us to reconsider the nature of spacetime, sparking research into fascinating concepts such as multiple universes and wormholes. It also profoundly influences our contemplation of free will and causal relationships.



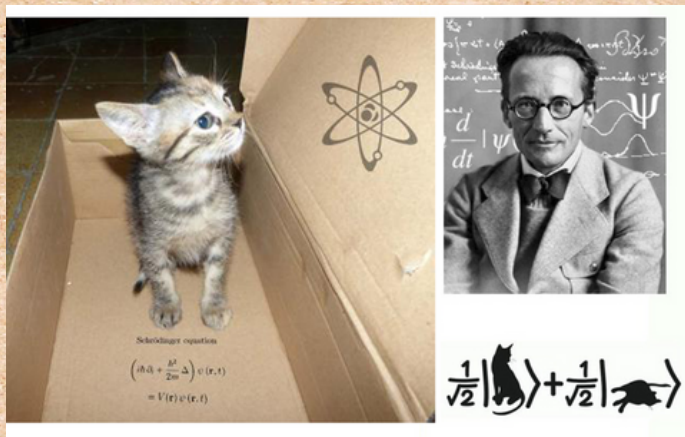
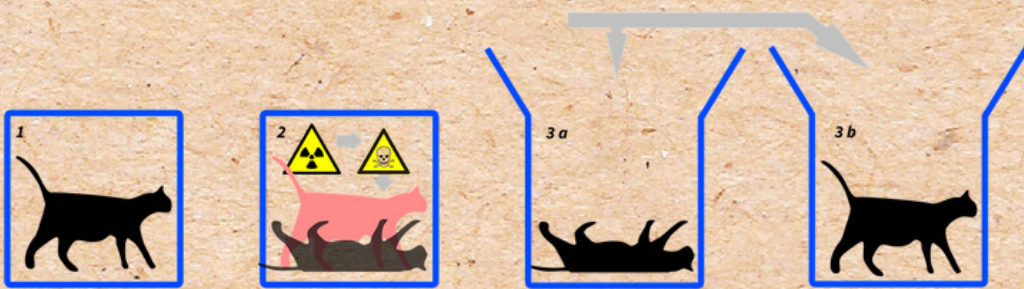
Schrödinger's cat



Schrödinger's Cat, proposed by physicist Erwin Schrödinger, explores the microscopic world and the concept of "quantum superposition." In this thought experiment, a cat in a sealed box is connected to a device linked to a tiny particle (e.g., a radioactive nucleus). If decay occurs, the cat dies; otherwise, it survives. Quantum superposition suggests the particle can exist in both decay and non-decay states when unobserved. This implies that before the box is opened, the cat is both dead and alive simultaneously, which appears paradoxical.



"Quantum superposition" is a phenomenon where microscopic particles, when unobserved, can exist in multiple possible states simultaneously, described by a mathematical concept called the wave function. Upon observation, the particle chooses one specific state to manifest.

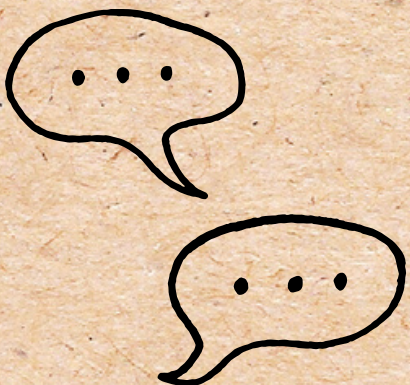


Schrödinger's cat experiment highlights the role of subjectivity in science, sparking philosophical debates on the observer effect and the nature of reality.

The Fermi Paradox and Extraterrestrial Life

Why haven't we come into contact with other extraterrestrial civilizations? With the vast number of stars and planets in the universe, why haven't we received any radio signals or visits from extraterrestrial civilizations?

The Fermi paradox, originating from Fermi's estimation, was proposed by Nobel Prize-winning physicist Enrico Fermi, a distinguished scientist in both physics and astronomy. The Fermi estimation is a probabilistic method aimed at estimating the existence of extraterrestrial intelligence in the universe. Considering the scale and lifespan of the universe, as well as the distribution of stars and planets, it concludes that there should be other highly advanced extraterrestrial civilizations. However, in contrast to our observations, we have yet to encounter extraterrestrial life, a discrepancy with the expected abundance and timescale of potential extraterrestrial life in the universe.



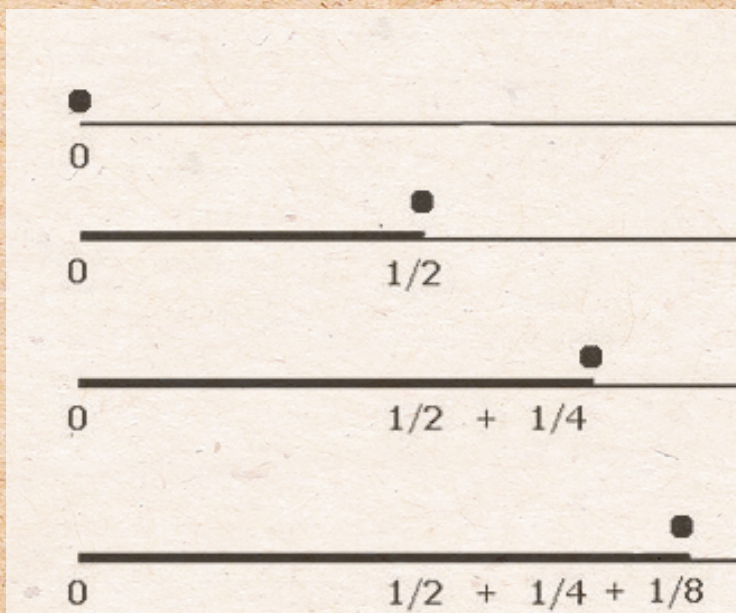
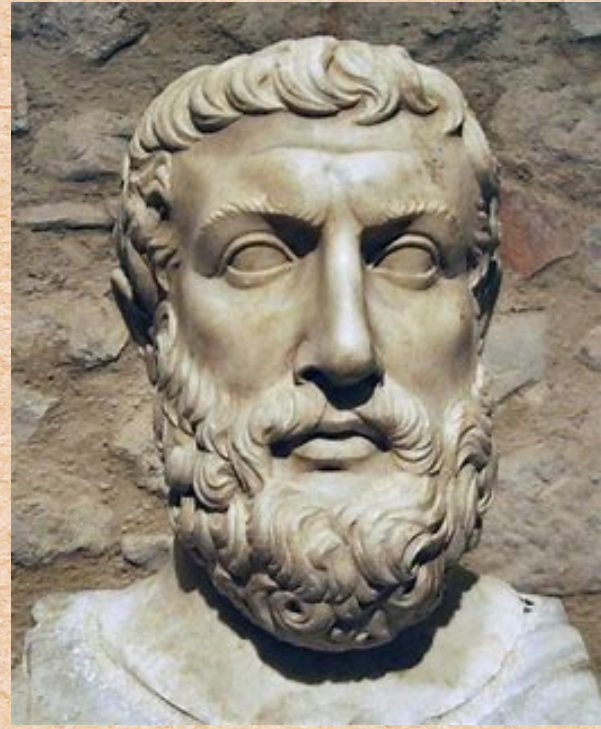
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The Fermi paradox has prompted profound reflections within the scientific community and among humanity. Firstly, it underscores the possibility of extraterrestrial life, sparking exploration into life in the universe and advancing the field of astronomy. Secondly, the Fermi paradox initiates philosophical and cultural contemplations, such as humanity's position in the cosmos, our own existence and development, and how we might respond to the potential existence of extraterrestrial life.

The dichotomy paradox (one of the Zeno's paradoxes)



The ancient Greek philosopher Zeno argued that, assuming an object is to be moved from point A to point B, it must first move half the distance of AB and then move the remaining half of the distance. But before it can move the remaining half distance, it must in turn move half of that half distance By this logic, it seems you can never get to the destination because you only travel half the distance each time.



Zeno's Paradox of Dichotomy emphasizes the tension between intuition and mathematical concepts, triggering profound contemplation on infinity and limits. It holds significant insights in both mathematics and philosophy, profoundly influencing our understanding of infinite processes and continuity.

Conclusion



Scientific paradoxes challenge our understanding of the natural world, compelling us to reevaluate existing assumptions and theories. It is through such challenges that science continuously evolves and progresses. The provocative nature of these paradoxes inspires scientists to delve deeper, striving to resolve seemingly contradictory or perplexing phenomena. Scientific paradoxes serve not only as profound tests for our knowledge systems but also as profound inquiries into human intelligence, urging us to transcend established boundaries of thought and explore the more intricate layers of the natural world. Despite the challenges inherent in this scientific exploration, it opens the gateway to unraveling the truth of science.