

PARADOXES OF QUANTUM THEORY

by [illegible]

Abstract: This paper discusses the paradoxes of quantum theory, including the wave-particle duality, the uncertainty principle, and the measurement problem. It explores the implications of these phenomena for our understanding of the physical world and the nature of reality.

The first paradox of quantum theory is the wave-particle duality. Light, which is known to be a wave, also exhibits particle-like behavior. This is demonstrated by the photoelectric effect, where light strikes a metal surface and causes electrons to be emitted. The energy of the emitted electrons depends on the frequency of the light, not its intensity. This suggests that light consists of discrete packets of energy called photons. However, light also exhibits wave-like behavior, such as interference and diffraction. This is demonstrated by the double-slit experiment, where light passing through two slits creates an interference pattern. This paradox is resolved by the concept of wave-particle duality, which states that light is neither a wave nor a particle, but something that can behave like either depending on the experimental conditions.