

## The Journey toward Quantum Gravity

In this presentation, I will delve into research concerning string theory as a framework for understanding quantum gravity. Beginning with the motivation behind quantum gravity based on the challenge of incorporating quantum matters into classical general relativity, I will first elucidate why quantum field theory, effective in describing the other three fundamental interactions, fails when applied to gravity. Subsequently, I briefly outline how string theory offers a promising avenue to explore quantum nature of gravity and introduce its two primary research directions: string phenomenology and formal theory. Focusing on the formal theory aspect, I will explain the concept of holographic duality and how it can be employed to deal with the complexity of path integral calculations within string theory.