

Recent developments in our understanding of black hole evaporation and the information paradox suggest that effects from quantum gravity are not necessarily hidden at the Planck scale. They might even one day be testable by gravitational wave measurements. To prepare ourselves, we must first understand what quantum gravity really means. Thankfully, we are pre-armed with a deep principle about gravity—that spacetime is really a hologram—and a powerful model for making this idea precise: gauge/gravity duality. The present challenge is to translate our questions about gravity into the natural language of the dual conformal field theory (CFT). I will describe the foundation for such a program that links the integral geometry of a gravitational spacetime to a CFT operator product expansion.