

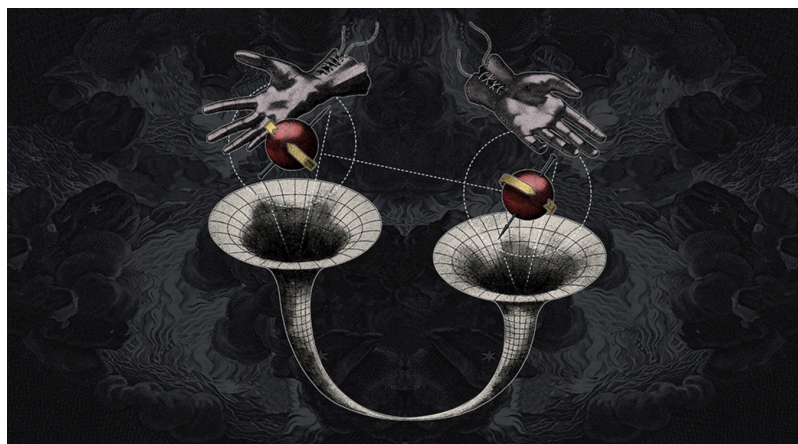


Yale Department of Physics

Juan Maldacena

Institute for Advanced Study

March 22, 29 and April 5, 2021 at 4:00 p.m. via zoom



Monday, March 22 “Black holes and the structure of spacetime”

Black holes are fascinating objects predicted by Einstein’s theory of general relativity. Together with quantum mechanics, they give rise to interesting theoretical questions. These have led to new perspectives on the quantum nature of spacetime.

Monday, March 29 “Wormholes and entanglement”

Wormholes have prominently featured in many science fiction stories. We will see how very basic principles of relativistic physics forbid wormholes that lead to faster than light travel. In general relativity there are simple non-traversable wormholes. And we will show how to make them traversable, but respecting the faster than light travel ban. We will discuss how all these wormholes are connected to entanglement and to quantum teleportation.

Monday, April 5 “The entropy of Hawking radiation”

Hawking famously showed that black holes emit thermal radiation. He also argued this radiation has an entropy that monotonically increases as the black hole evaporates, which presents a problem for the idea that black hole formation and evaporation can be described by conventional quantum mechanics. We will review recent developments on the entropy of gravitational systems. Applied to Hawking radiation we get an entropy consistent with quantum mechanics

The Leigh Page Prize Lecture series are given each year by a distinguished physicist in honor of Leigh Page who received his PhD in Physics from Yale in 1913. He was later acting Chair and Director of the Sloane Physics Laboratory. Professor Page devoted his time to teaching (mostly graduate classes), research, and writing several textbooks. Since 1967, several speakers in the Leigh Page Prize Lecture series have later received Nobel Prizes and other and notable awards. In connection with the lecture series, a prize is offered to first year graduate students in recognition of their fine academic record and for the promise of important contributions to the field of physics

Host: Walter Goldberger