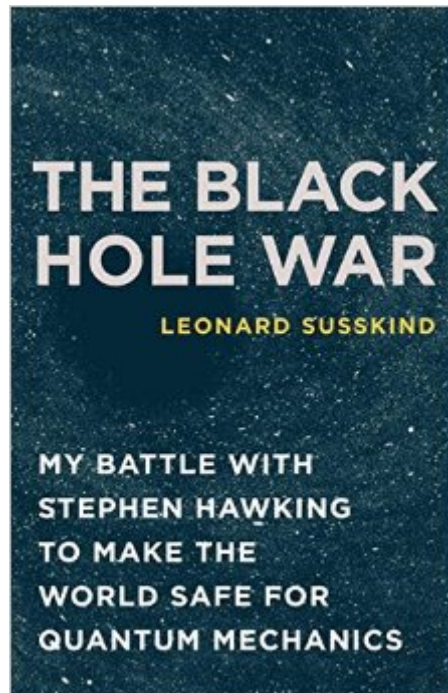


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The Black Hole War: My Battle With Stephen Hawking To Make The World Safe For Quantum Mechanics



Synopsis

What happens when something is sucked into a black hole? Does it disappear? Three decades ago, a young physicist named Stephen Hawking claimed it did-and in doing so put at risk everything we know about physics and the fundamental laws of the universe. Most scientists didn't recognize the import of Hawking's claims, but Leonard Susskind and Gerard t'Hooft realized the threat, and responded with a counterattack that changed the course of physics. THE BLACK HOLE WAR is the thrilling story of their united effort to reconcile Hawking's revolutionary theories of black holes with their own sense of reality-effort that would eventually result in Hawking admitting he was wrong, paying up, and Susskind and t'Hooft realizing that our world is a hologram projected from the outer boundaries of space. A brilliant book about modern physics, quantum mechanics, the fate of stars and the deep mysteries of black holes, Leonard Susskind's account of the Black Hole War is mind-bending and exhilarating reading.

Book Information

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Customer Reviews

The book discusses a problem. According to Hawking, when an object falls down a black hole (BH),

all information is lost. The problem is that this violates a principle of physics that information is never lost. The future cannot lose track of the past, for then the past would cease to exist, as the only meaning to the past is present observations and records. Susskind proposes a solution that took him a decade to resolve, and he discusses this in the book. The solution is the Holographic Principle, which is that all the information inside the 3-dimensional sphere of the BH resides on the 2-dimensional surface. An object falling down a BH never crosses the surface, and so the information is not lost. There is a "dual description" that does not refer to the inside. Susskind makes heavy use of String Theory to establish the theory. Actually, one can arrive at the same conclusion without the use of String Theory or quantum mechanics, by simply focusing on basic principles of physics and general relativity (GR). According to GR, it takes an object forever to reach the BH, and so it never gets inside. We therefore cannot speak about the inside. Everything falling down a BH is eternally falling, and so the information is not lost. We cannot speak about the inside of the BH. This then is exactly Susskind's Holographic Principle, where all information is outside the BH. Science, and in particular physics, is a collection of theories. A theory is a mathematical system along with observational and experimental agreement. If it is impossible in principle to perform an observation, the theory cannot speak about that situation. Science also includes guesses, research proposals, and hypotheses, not all of which are theories.

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