



# Tabletop Analog Black Holes and Information Loss Paradox

陳丕燊 教授  
臺灣大學物理系

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## Abstract

43 years ago, Stephen Hawking combined quantum field theory with Einstein's theory of general relativity and discovered black hole evaporation. The debate over whether information is really lost during Hawking evaporation has persisted ever since. Almost all the contemporary leading theoretical physicists have participated in this "black hole war". In quantum mechanics, the probability, or information, must be preserved before and after a physical process. The seeming loss of information as a result of the black hole evaporation therefore implies that general relativity and quantum mechanics, the two pillars of modern physics, may be in conflict. So far the debate remains purely theoretical, since the resolution of this paradox relies on the knowledge of the end stage of BH evaporation, yet typical BHs in the universe are too young and cold. Earlier this year, Pisin Chen proposed a table top analog BH experiment using plasma mirrors created by ultra intense lasers. He further organized a new international AnaBHEL (Analog Black Hole Evaporation via Lasers) Collaboration that includes institutions from France, Japan, Mainland China, and Taiwan, to carry out the experiment. This seminar will introduce the history and the physics of BH information loss paradox and the concept of the proposed analog BH experiment.

歡迎大家踴躍參加!