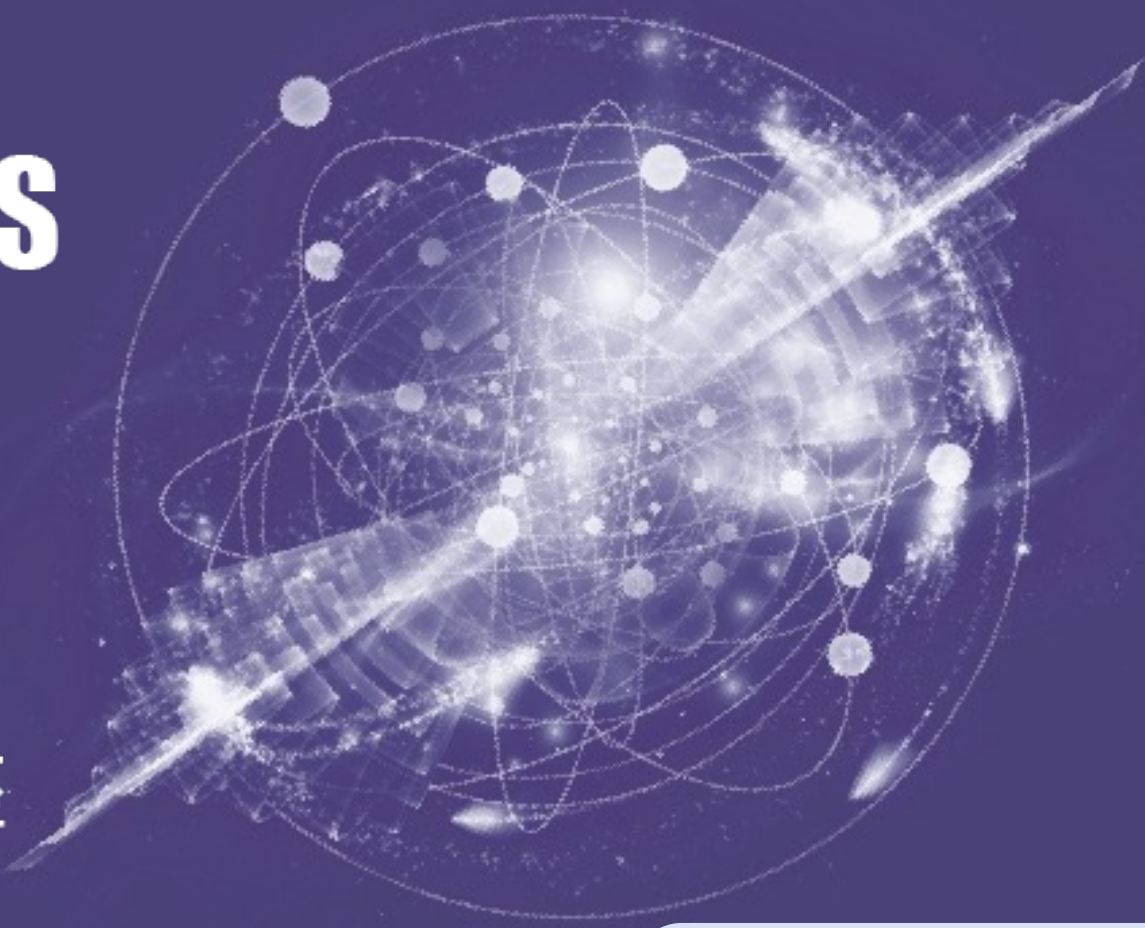


LECTURES ON FRONTIERS OF QUANTUM MATTERS

量子物质前沿讲座



清华大学
Tsinghua University

TITLE |

Recent progress on the black hole information paradox

SPEAKER |

Yiming Chen
(Princeton University)



TIME |

14:00-15:30 Feb 22, 23, 24 (2023)



VENUE |

Room 322, Science Building
Tsinghua University

主办方：清华大学高等研究院

ABSTRACT

Hawking's black hole information paradox is one of the most central problems in quantum gravity. Significant progress has been made on this old problem in the last few years. In this lecture series, I will review the main ideas behind the new progress and discuss how they could teach us more lessons about quantum gravity. The lectures are targeted at general audiences, with only minimal knowledge of general relativity and path integral assumed.

Lecture I: The basics of black hole thermodynamics and Hawking evaporation. I will discuss the precise formulation of the information problem as computing the Page curve for the entropy of Hawking radiation.

Lecture II: Methods of computing entropies in quantum systems coupled to gravity. Apply these methods to evaporating black holes and see how the Page curve can be derived. Along the way, we will pick up important concepts such as the quantum extremal surface formula and replica wormholes.

Lecture III: Continue to discuss some further implications and future perspectives. If time permits, I will cover some of my own work on this subject, such as arXiv:1912.02210 and arXiv:2011.06005