IOA Seminar

Particle Creation and Entanglement Structure in the Analogous Spacetime

Date 13:00 - 14:30, May 16 (Monday)

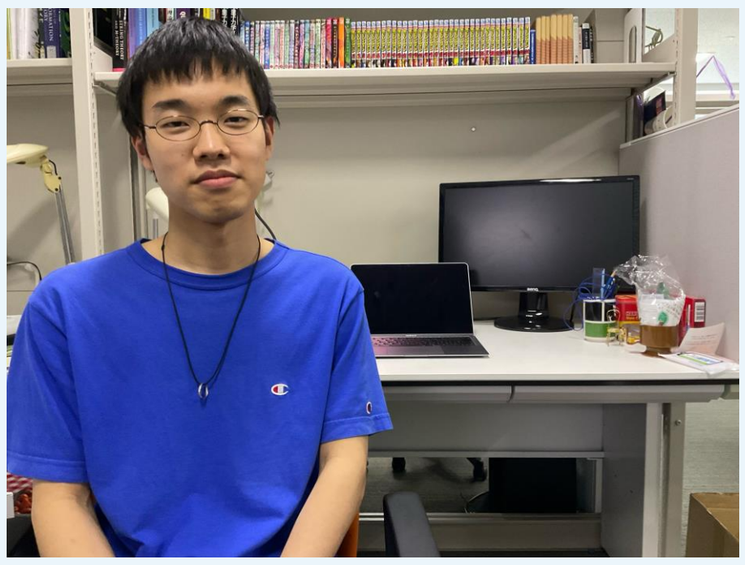
Place 1130, Building 9 (Zoom ID: 881 5903 1592)

Speaker

Yuki Osawa (大澤悠生)

Graduate School of Science,

Nagoya University (名古屋大学)



Abstract

About fifty years has passed since Hawking predicted that black holes radiate with the temperature determined by the surface gravity at the horizon (Hawking radiation).Although many theories (e.g. black hole thermodynamics, emergent gravity) are based on Hawking's theory, this theory has several theoretical problems.

One of them is the trans-Panckian problem (problem about the origin of the Hawking radiation).Unruh's proposal for this problem is considering the analogous black holes which use the analogy between scalar fields in the black hole spacetime and sonic waves in the moving fluid. For the analogous systems, the cutoff for the wave number is naturally introduced due to the distance between atoms of the fluid and trans-Planckian problem is avoided.However, the structure of the quantum entanglement should behave differently from that of Hawking's original scenario.

In this talk, I will briefly review the trans-Planckian problem and analogous black holes firstly. After that I will introduce our analysis of the power spectrums of the radiation and the entanglement structure for the analogous systems, and discuss the effects of the cutoff to the Hawking radiation.