

SUPERRADIANT SCATTERING OF MASSIVE SCALAR FIELD DUE TO MAGNETICALLY CHARGED ROTATING BLACK HOLE

Seminar

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ABSTRACT

Rotating black holes are well-known for amplifying perturbing bosonic fields within specific parameter ranges, a phenomenon commonly referred to as superradiance. Besides spacetime rotation, charge also plays a significant role in amplification. In this presentation, we will explore the superradiant scattering states of a massive scalar field in the spacetime of a magnetically charged rotating black hole, arising from the interaction between a nonlinear electromagnetic field configuration and gravity. We will specifically examine how the magnetic charge of this spacetime influences the magnitude of amplification and the allowed frequency ranges for superradiance. Furthermore, the effective potential for a massive scalar field in the rotating spacetime also leads to the superradiant bound states. Therefore, our next focus will be on the superradiant instability regime for the magnetically charged black hole due to the massive potential barrier. Along the talk, we will compare the results for this magnetically charged black hole with the electrically charged Kerr-Newmann black hole. Finally, we will end with the conclusion and the future outlook.



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03:00 PM



PAMU SEMINAR ROOM



Everyone is invited to attend