EXPLORING ASYMPTOTIC SYMMETRIES, SOFT FACTORS, AND CELESTIAL HOLOGRAPHY

Seminar

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ABSTRACT

Recent advancements have unveiled an intriguing connection between asymptotic symmetries, soft theorems, and memory effects in gauge and gravity theories, culminating in a promising variant of flat space holography known as celestial holography. This presentation will cover two significant areas of research within this framework. First, we explore perturbative corrections to flat spacetime soft factors in the presence of a small negative cosmological constant. At the classical level, soft factors are derived from radiative profiles associated with gravitational and electromagnetic bremsstrahlung in the low-frequency limit. Our study investigates the scattering of a probe particle by a four-dimensional AdS black hole with a small negative cosmological constant, examining a double "soft limit" of radiation to extract the "soft factor." Since the leading soft factor exhibits universality beyond tree level, which enables us to derive a correction to the Ward identity in alignment with the equivalence between large gauge Ward identities and soft photon theorems in asymptotically flat spacetimes. Additionally, we recover this corrected large gauge Ward identity from the CFT Ward identity at the boundary in the large AdS radius limit. In the second part of my presentation, I will talk about construction of a celestial CFT four-point correlator for a specific eikonal scattering on the horizon of an eternal Schwarzschild black hole, shedding light on the celestial holography perspective in black hole spacetime.

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03:00 PM

PAMU SEMINAR ROOM

Everyone is invited to attend