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Approximation of the naive black hole degeneracy

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Loop quantum gravity predicts that the area is quantized as the area operator only admits discrete eigenvalues. In 1996, Rovelli suggested a connection between the black hole entropy and the area spectrum; the number of ways in which the area of the black hole horizon can be expressed as the sum of the unit areas (i.e. area eigenvalues) is the black hole degeneracy. In this talk, I will calculate the black hole degeneracy (i.e. the exponential of black hole entropy) by using Rovelli's idea. However, it is now widely believed in loop quantum gravity community that Rovelli's picture of black hole entropy is not the complete answer, as one has to further impose an extra condition. The word "naive" in the naive black hole degeneracy means that this extra condition is not considered; I only use Rovelli's idea. However, it may be possible that the naive black hole degeneracy is the real black hole degeneracy (i.e. that we do not need to take the extra condition) as I showed in another paper of mine with Brian Kong.

Biography

Youngsub Yoon has received his Bachelor's degree from Harvard University in 2010 and Master's degree from Seoul National University in 2016. He currently resides in Daejeon, South Korea.

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