



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Gravitational positivity bounds

(Zoom Seminar)

Katsuki Aoki

(Kyoto U.)

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Time: 11 AM IST

Zoom link shall be shared separately



Underlying assumptions on ultraviolet completion can impose constraints on its low-energy effective field theories (EFTs). The swampland program aims to clarify consistent and inconsistent EFTs with quantum gravity and aims to understand quantum gravity from low-energy physics and vice versa. One of the most well-established constraints is called positivity bounds, provided that general assumptions such as Poincare invariance and unitarity are satisfied at all scales. I will explain what underlying assumptions are needed and how these consistency conditions arise from the assumptions, especially in the presence of gravity. I will also discuss the implications of the gravitational positivity bounds. In particular, I will show that the gravitational positivity bound is violated if the Standard Model of particle physics coupled to General Relativity is extrapolated up to 10^{16} GeV, suggesting that quantum gravity (UV completion) is already required below the Planck scale.

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