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Axion-Photon couplings in type IIB string theory

Tuesday 18 July 2023 10:00 (30 minutes)

In this talk I will consider the string theory axiverse in type IIB Calabi-Yau orientifold compactifications, and focus on the computation of axion photon couplings and hierarchies that arise in the many axion limit —i.e. at large values of $h^{1,1}$. In particular, I will discuss two distinct phenomena that hierarchically suppress axion photon interactions when the QED divisor is small: the former is a suppression in ratios of mass scales that decouples all axions lighter than the QED axion. The latter is geometric in origin: at most a handful of mass eigenstates have internal wavefunctions that significantly overlap with QED.

Equipped with these insights I will present preliminary data on cosmic birefringence, and astrophysical constraints on the axiverse.

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