Moduli Space Quantum Mechanics

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Abstract

In my talk I introduce quantum mechanics in moduli scape of string theory. Moduli fields and functions of them, like the species scale or tower mass scales, are considered as operators, and we will consider commutation relations among them. Then we will discuss the moduli space wave function, which describes a quantum particle moving in moduli space. We discuss the spectrum of the associated moduli space Laplacian, showing that in contains normalizable bounds states of positive energy and fixed values of the moduli fields in case the moduli space is compactifiable. In addition we also include a potential, where quantum effects can result in moduli localised away from classical minima and in excited, positive energy states, even in cases where the classical potential exhibits a runaway behaviour. This might provide a new way for quantum moduli stabilisation and getting states in cosmology with positive energy.

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