

Soutenance de thèse de doctorat

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Mercredi 06/09/2017, 15h00

Orme des Merisiers Amphi Claude Bloch, Bât. 774

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IPhT

**Composite Anomaly in Supergravity and String  
Amplitude comparison**

We examine the structure of composite anomaly in maximal and half-maximal supergravity theories especially in eight space-time dimensions. The number of super-charges dictates the structure of the coset space of the moduli fields of the theory which in turn engenders the composite anomaly in such theories. Our main achievement lies in proposing counter-terms for such anomalies. These terms are of stringy nature and we show by explicit 1-loop amplitude calculations in corresponding string theories that those counter-terms are consistently provided by string amplitude. In the light of non-perturbative higher dimensional theories like F-theory, the anomaly cancelling counter-terms are seen to be related to co-dimension two-branes e.g. 7-branes. We then use these results of 8-dimensional theories to provide for supergravity theories in six-dimensions by compactifying on a sphere in the presence of 5-branes. This is in fact a simulation of K3 compactification and our knowledge of composite connection provide us with threshold conditions to achieve such compactifications. All these analysis provide for greater insight into the non-perturbative regime of string theory. We then conclude with a calculation of 2-loop Heterotic string amplitude which has been very less explored in the literature.

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