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String Theory in Greater Paris

Rencontres Théoriciennes

"Supergravité, théorie des cordes et théorie M"

Jeudi 12 Mai 2016, 10:00

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M-strings and Little Strings

I study BPS excitations in M5-M2-brane configurations with a compact transverse direction, which are also relevant for type IIa and IIb little string theories. These configurations are dual to a class of toric elliptically fibered Calabi-Yau manifolds X_N with manifest $SL(2, \mathbb{Z}) \times SL(2, \mathbb{Z})$ modular symmetry. They admit two dual gauge theory descriptions. For both, the non-perturbative partition function can be written as an expansion of the topological string partition function of X_N with respect to either of the two modular parameters. I analyse the resulting BPS counting functions in detail and unravel a number of remarkable relations. In particular, I find that for certain M2-brane configurations, the free energies in the two dual theories agree with each other. This points to a new correspondence between instanton and monopole configurations and is also a manifestation of T-duality between type IIa and IIb little string theories. Finally, I briefly comment on a generalisation of these results to orbifolds of little string theories.

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