

## Tetrahedron instantons and M-theory lift.

*Wednesday, July 6, 2022 5:00 PM (1 hour)*

: In this talk, I will discuss various aspects of tetrahedron instantons and the M-theory lift. Tetrahedron instantons are realized in type IIA superstring theory by bound states of D0-branes and four stacks of intersecting D6-branes with a suitable constant B-field. The tetrahedron instanton partition function admits an elegant closed-form expression depending only on the Omega-deformation parameters. Remarkably, the tetrahedron instanton partition function is equal to certain specialization of the magnificent four partition function, indicating the creation of intersecting D6-branes when a D8-brane annihilates with an anti-D8-brane. Meanwhile, the M-theory lift of our configuration is expected to be  $\mathbb{R} \times X$ , where  $X$  is a noncompact Calabi-Yau fivefold and can be thought of as a superposition of Kaluza-Klein magnetic monopoles. We detect the property of  $X$  using the index of M-theory on  $X$ , which coincides with the tetrahedron instanton partition function up to an appropriate perturbative factor. The talk is based on joint work with E. Pomoni and W. Yan.

**Primary author:** ZHANG, Xinyu (DESY, Hamburg)

**Presenter:** ZHANG, Xinyu (DESY, Hamburg)