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Friday, 28 October 2022 09:30 (30 minutes)

[Session Chair: Spenta Wadia (ICTS)]

“Deriving the Simplest Gauge-String Duality”

The simplest large N gauge theory is, arguably, the Gaussian matrix (or more generally, one hermitian matrix) integral. We will explicitly show that arbitrary correlators of single trace operators in this theory (without any double scaling limit) are identical to corresponding physical correlators in a dual topological string description. We will present both a novel A-model dual and also a mirror B-model Landau-Ginzburg description. The equality of correlators arises via open-closed-open string triality and a surprising relation to the $c=1$ string theory. The goal will be, however, to go beyond demonstrating equality but rather to make the duality manifest. For the B-model description this involves Eynard’s recasting of topological recursion relations in terms of intersection numbers on moduli space. For the A-model this goes through the relation of Gaussian correlators to the special Belyi covering maps or equivalently, discrete volumes of moduli space. Finally, we also briefly mention the significance of these results for the gauge-string duality of $N=4$ Super Yang-Mills theory. (Based on upcoming works with Edward Mazenc).