

## Knot, matrix and tensor models...melon or meron?

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The Gaussian mean of  $N \times N$  Hermitian matrix provides a knot configuration in the replica limit  $N \rightarrow 0$  (arXiv:2301.06003). The classical knot is related to Chern-Simons gauge theory, which shows two edges of Seifert surface are bounded, similar to two merons bounded into instanton. Higher dimensional knot (2-knot) consists of double Chern-Simons gauge field, which leads to Regge 6-j symbols tensor model for 3d gravity. We discuss the relation between the intersection numbers of p-spin curves and the quantum knots. The 4 dimensional Chern-Simons N=2 Yang Mills has an instanton, described by Nekrasov integral, which is akin to the replica formula for the intersection theory.

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