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Sergei G Gukov* (gukov@theory.caltech.edu), Caltech 452-48, Pasadena, CA 91125. *The Physics of Knot Homologies.*

The main goal of this talk is to explain the physical interpretation of the existing link homologies – such as the Khovanov homology or knot Floer homology – and to propose their various generalizations motivated from physics. In particular, starting with a brief introduction into knot homology theories, I will describe a framework for unifying the $\mathfrak{sl}(N)$ Khovanov-Rozansky homology (for all N) with the knot Floer homology. This unification, based on the interpretation in topological string theory, is accomplished by a new triply graded homology theory which categorifies the HOMFLY polynomial. Further insights can be obtained by realizing knot homologies in gauge theory. As I will explain in the main part of the talk, surface operators in gauge theory and braid group actions on categories play an important role in such realizations. (Received August 05, 2006)