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Both "quantization" and "categorification" have influenced many recent developments in pure mathematics and modern mathematical physics, ranging from applications in knot theory to geometric representation theory.

Yet, these deep and fundamental concepts can be explained in simple and concrete examples, which will be one of the main goals in my lectures. I will follow a "hands-on" approach, aimed at understanding explicit calculations in addition to learning the general theory. For example, we will see how a simple 19th century combinatorial problem can provide an answer to colored knot homology, and how the same answer can be reproduced from "quantization of algebraic curves," subject that has been very popular in recent years in physics as well as in pure math.

Moreover, with the help of these illustrative examples I will try to explain that in many problems coming from the study of knots and 3-manifolds there is a deep connection between "categorification" and "quantization." We shall see how this connections leads to many new results and exciting conjectures.