COMPARING ADDITIVE AND MONOIDAL CATEGORIFICATION VIA QUANTUM AFFINE ALGEBRAS

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Abstract:
Given an affine simple Lie algebra $\widehat{\mathfrak{g}}$, one can consider its universal enveloping $U(\widehat{\mathfrak{g}})$. Following Drinfeld and Jimbo, the latter can be quantised which will result in the so-called quantum affine algebra $U_q(\widehat{\mathfrak{g}})$. In this talk we will be interested in its representation theory. An important tool for this, is the canonical basis of Lusztig whose multiplicative properties are given by a combinatorial model called a cluster algebra. The first half of the talk will be introductory by recalling these concepts and also two main methods, an additive and a monoidal, to categorify such algebras. In the second half we will focus on these categorifications and more precisely on conjectural connections between them. Especially the role of denominators of R-matrices and recent work of Ryo Fujita will be emphasized. To end, we will report on ongoing work.