
Foam lectures on link homologies

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Résumé

The aim of these lectures is to give an introduction to various link homologies and connection between them. The theories covered will include the classical Khovanov-Rozansky triply graded link homology and Khovanov homology. Everything will be presented through the prism of foams.

1. Algebraic construction of triply graded link homology using Soergel bimodules and Hochschild homology. Combinatorial view on (part of) the construction using webs and foams.

2. Introduction to the foam evaluation formula and connection to the previous lecture and to the original Khovanov homology.

3-4 Variation around the construction to build other link homologies called symmetric $\mathfrak{gl}(N)$ Khovanov-Rozansky link homologies. Focus on the case $N=1$ and $N=0$ and relationship with Knot Floer homology.

(Unlikely bonus for unlikely remaining time) Equivariant link homologies as representation of $\mathfrak{sl}(2)$.

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