Contribution ID: **14** Type: **not specified**

The Dyck path algebra associated to a surface

Thursday 19 September 2024 17:30 (1 hour)

The Dyck algebra $\mathbb{A}_q$ and the double Dyck path algebra $\mathbb{A}_{q,t}$ were introduced by Carlsson and Mellit as part of their proof of the shuffle conjecture and the latter is known to be related to the type A double affine Hecke algebra. In this talk, we will see how to define a skein theoretic version of Dyck path algebra $\mathbb{A}(\Sigma)$ associated to a surface Σ. We will focus on the following cases: the disk, the annulus and the torus. These last two give variants of the Dyck and double Dyck path algebra, respectively. By studying these algebras further, we give a basis of $\mathbb{A}(D)$, together with a tableau interpretation, and conjecture one for $\mathbb{A}(A)$. This is based on a joint work in progress with A. Mellit and C. Novarini.

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