

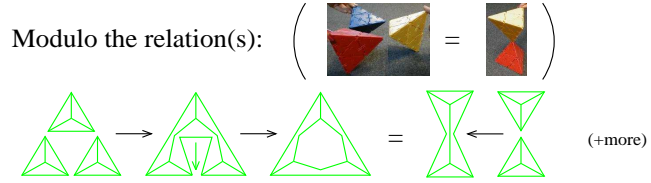
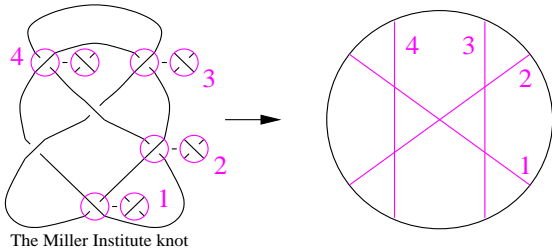
## Knotted Trivalent Graphs, Tetrahedra and Associators



$\omega := \text{http://www.math.toronto.edu/~drorbn/Talks/Louvain-1506}$

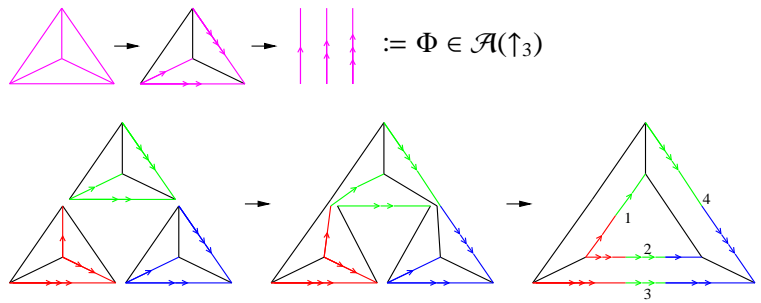
Handout, video, and links at  $\omega$

Goal:  $Z: \{\text{knots}\} \rightarrow \{\text{chord diagrams}\}/4T$  so that

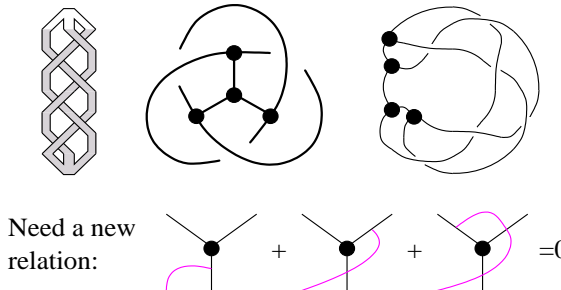


**Claim.** With  $\Phi := Z(\Delta)$ , the above relation becomes equivalent to the Drinfel'd's pentagon of the theory of quasi Hopf algebras.

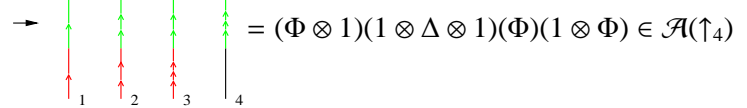
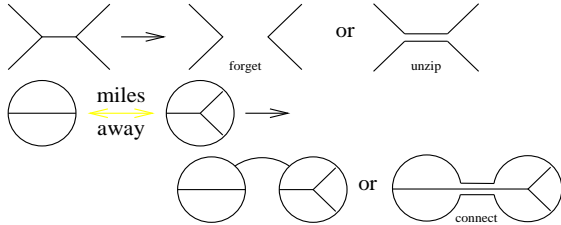
**Proof.**



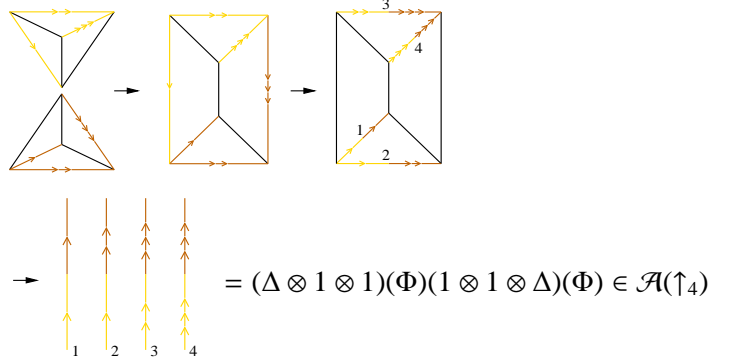
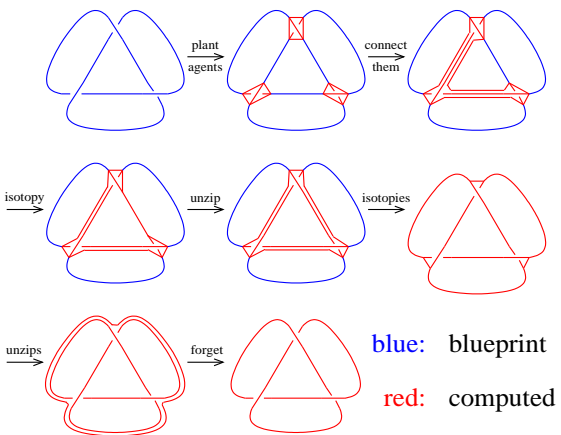
Extend to Knotted Trivalent Graphs (KTG's):



Easy, powerful operations:



Using operations, KTG is generated by ribbon twists and the tetrahedron  $\Delta$ :



**Ribbon Knots and Algebraic Knot Theory.**

