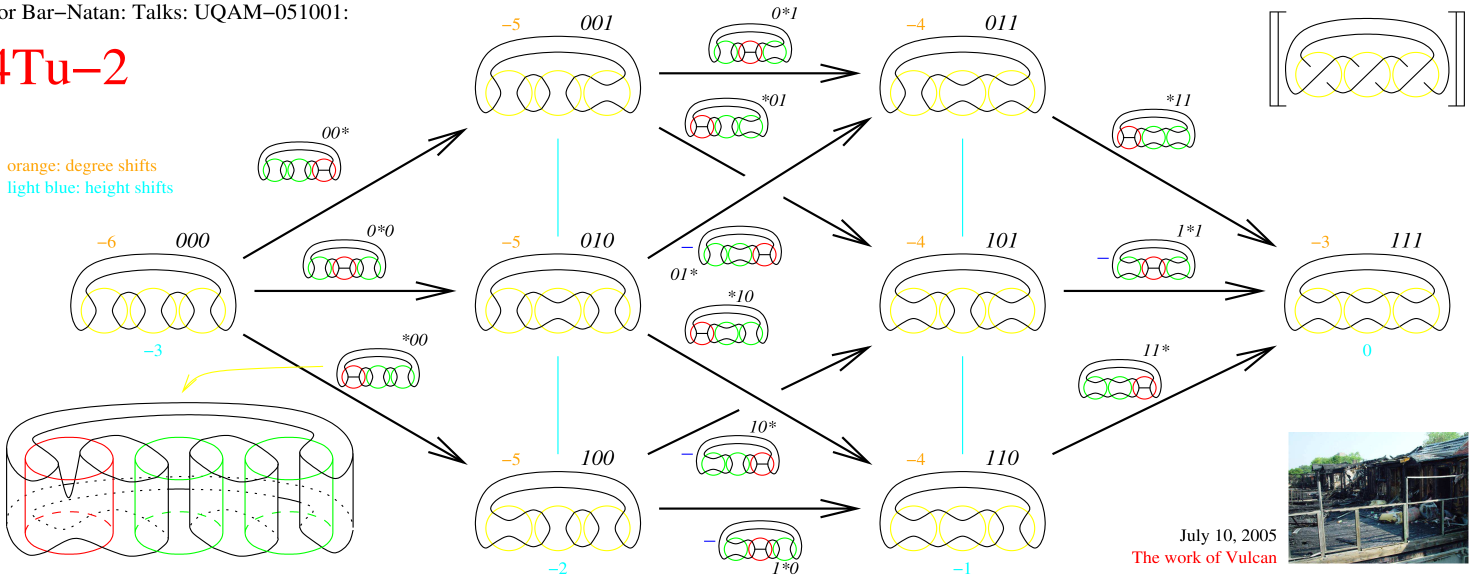
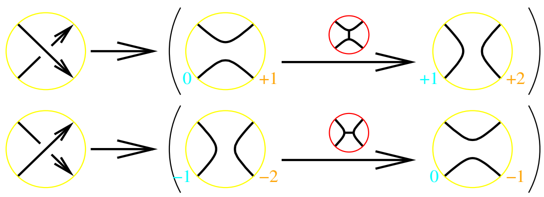
4Tu−2

orange: degree shifts
light blue: height shifts



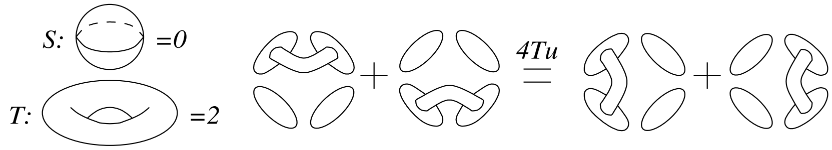
General Crossings



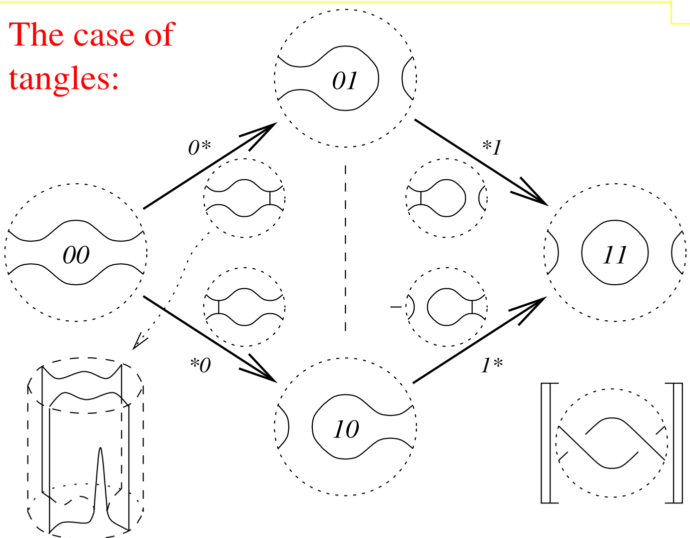
Where does it live?

In *Kom(Mat(<Cob> / {S, T, 4Tu})) / homotopy*

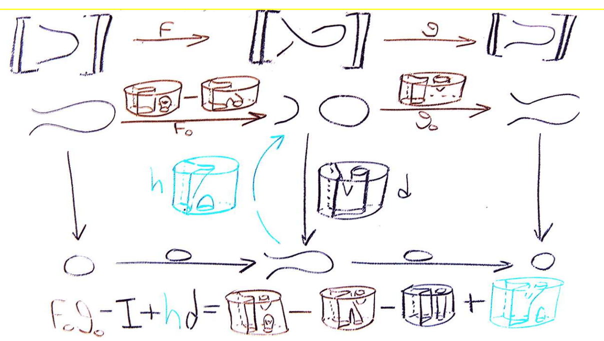
Kom: Complexes Mat: Matrices Cob: Cobordisms <...>: Formal lin. comb.



The case of tangles:



Invariant!



Kurt Reidemeister

The Reduction Lemma. If ϕ is an isomorphism then the complex

$$[C]\xrightarrow{\begin{pmatrix}\alpha\\ \beta\end{pmatrix}}\begin{bmatrix}b_1\\ D\end{bmatrix}\xrightarrow{\begin{pmatrix}\phi & \delta\\ \gamma & \epsilon\end{pmatrix}}\begin{bmatrix}b_2\\ E\end{bmatrix}\xrightarrow{\begin{pmatrix}\mu & \nu\end{pmatrix}}[F]$$

is isomorphic to the (direct sum) complex

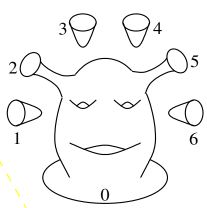
$$[C]\xrightarrow{\begin{pmatrix}0\\ \beta\end{pmatrix}}\begin{bmatrix}b_1\\ D\end{bmatrix}\xrightarrow{\begin{pmatrix}\phi & 0\\ 0 & \epsilon-\gamma\phi^{-1}\delta\end{pmatrix}}\begin{bmatrix}b_2\\ E\end{bmatrix}\xrightarrow{\begin{pmatrix}0 & \nu\end{pmatrix}}[F]$$

The work of Naot.

<surfaces>/4Tu is freely generated by Shrek surfaces

Gad Naot

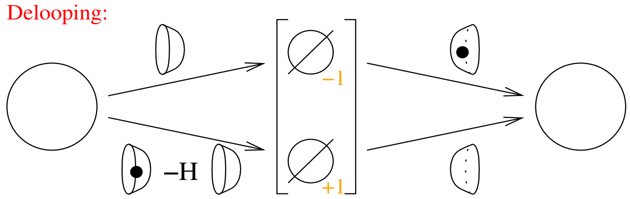
A Shrek surface with 7 boundaries (one distinguished), 3 handles and 2 tubes



שרעק

Let ● denote a tube to the distinguished component (the curtain), and let H denote a handle on the curtain. Then

Delooping:

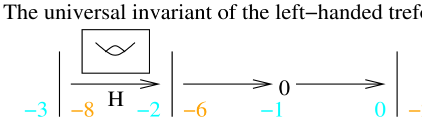


... so the invariant is valued in complexes over a category with just one object and morphisms in Z[H]; all is graded and degH=−2.

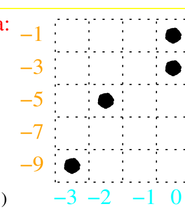
The work of Green.

Jeremy Green

The universal invariant of the left−handed trefoil is

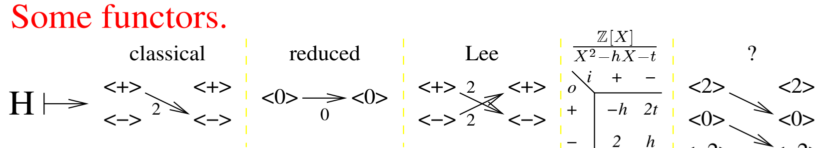


standard data:



(and the invariant of the 48 crossing T(8,7) is computable in minutes...)

Some functors.



(Lee's spectral sequence and Rasmussen's invariant also recoverable)

http://www.math.toronto.edu/~drorbn/Talks/UQAM−051001/

More at http://www.math.toronto.edu/~drorbn/Talks/UQAM-051001/