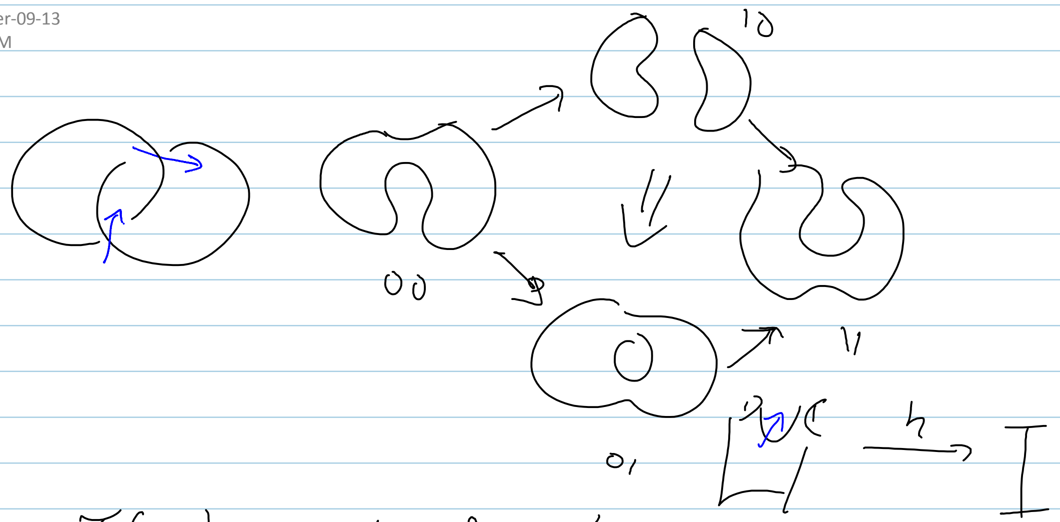
# Meeting with Putyra

October-09-13
5:22 PM




$Z(D)$ = cube of res's for $D$

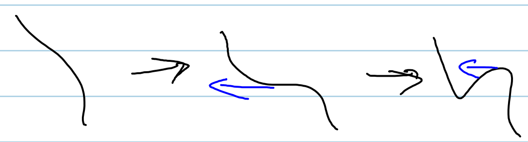
in a 2-cat of chronological cobordisms

① height function

② framing

$f: W^n \longrightarrow \mathbb{R}$

① allow $A_2$-sing.'s



② add framing:

- Riem str on $W$

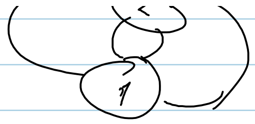
$\mathrm{Hess}_p(f): T_pW \longrightarrow T_pW$

$\quad\quad = E^+(p) \oplus E^-(p)$

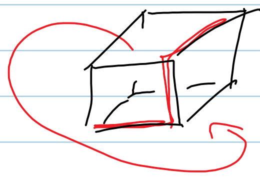
choose an orthon basis for $E^-(p)$.

Thm (Lurie, Eliashberg-Mishachev)

The space of framed fun's is contr.



<u>Cor</u> $\mathcal{I}(D)$ is 2-commutative

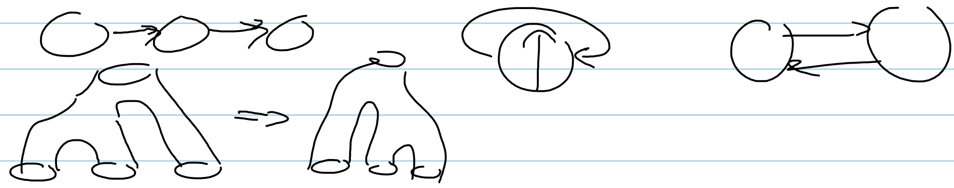


ring of coefficients

<u>Thm</u> There is a complex in $RChCob^3(k)$ which is invariant up to homotopies / odd versions of S/T/4Tu rels

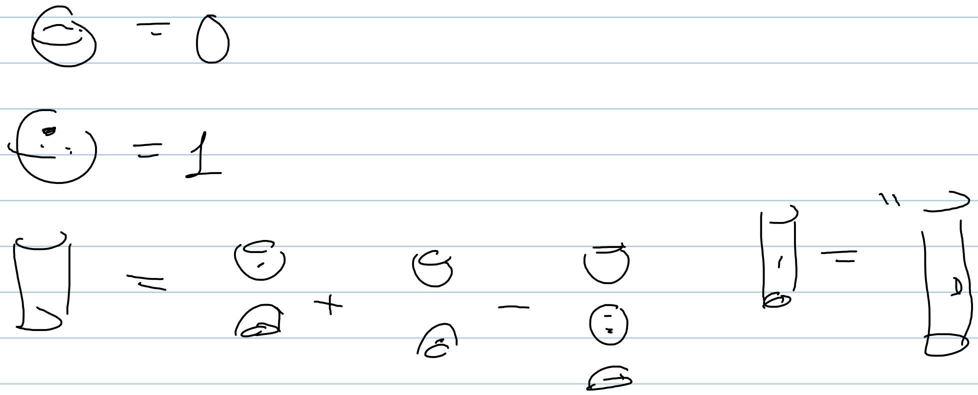
$$ChCob^3(k) \xrightarrow{\text{2-funct}} RChCob^3(k) \quad \text{"linearization"}$$

$\mathcal{I}(D)$ + 2-complex $\psi$



. . .

$$RChCob^3(k) \xrightarrow{\text{strict}} Mod_S$$

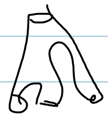
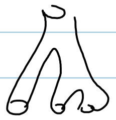
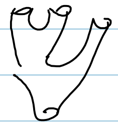
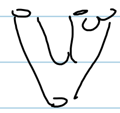


$= 0$

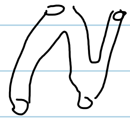
$= 1$

$$Mor(\emptyset, \emptyset) \cong R[h, t] / ((XY-1)h, (XY-1)t) = R.$$

$$\mathrm{Mor}(\emptyset, \bigcirc) \cong R_0 v_+ \oplus R_0 v_-$$

 $= X$    $= Y$ 

$$X^2 = Y^2 = 1$$

 $= Z$ 

odd: $Y = -1, \quad X = Z = 1$

$\Rightarrow$ no "easy" Lee deformation of odd theory

$\Rightarrow$ odd theory self-dual

$$X \longleftrightarrow Y$$
$$Z \longleftrightarrow Z^{-1}$$

$$H_{X,Y,Z} \longleftrightarrow H_{1,XY,Z}$$

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$$\begin{tikzcd}
 & U_{q,\pi} \arrow[dl, "\pi=1"'] \arrow[dr, "\pi=-1"] & & \mathcal{U}_{q,\pi} \arrow[ll] \arrow[dl] \arrow[dr] & \\
U_q(sl_2) & & U_q(osp(1|2)) & \dot{\mathcal{U}} & ?
\end{tikzcd}$$

$$\begin{tikzcd}
 & H^{cov}_{1,Y,1} \arrow[dl, "Y=1"'] \arrow[dr, "Y=-1"] & \\
H^{ev} & & H^{odd}
\end{tikzcd}$$

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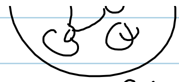
Tangles?

D = planar arc diagram 

$D: ChCob^3(k_1) \times ChCob^3(k_2) \longrightarrow ChCob^3(\ldots$

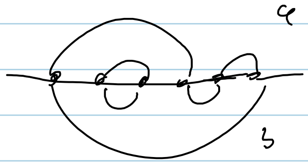


Di: $ChCob^3(k_1)\times\dots\times ChCob^3(k_n) \longrightarrow ChCob^3(k)$

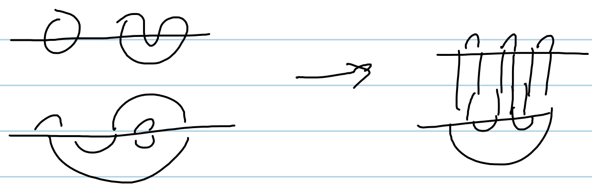
is not strict

$\rightarrow$ no planar algebra of $\mathrm{Kom}(\mathcal{R}\,ChCob^3(k))$

$OH_n$ rings



$\longrightarrow {}_aH_b = F(\text{pict})$



$H \otimes H \longrightarrow H$

$\rightarrow$ $OH_n$ is not associative, but quasi-associative.

$$x\cdot(y\cdot z) = \varphi(|x|,|y|,|z|)(x\cdot y)\cdot z$$

$$\varphi: G\times G\times G \longrightarrow \{\pm 1\}$$

for $OH_n$, $G_n = (\text{groupoid of crossingless matching of } 2n \text{ pts}) \times \mathbb{Z}$

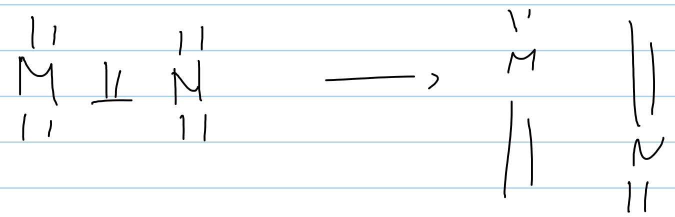
what we have:

- If $T$ a crossingless tangle there is a graded $(OH_n, OH_m)$-bimodule $C(T)$

  by a set $G_n \circlearrowright S \circlearrowleft G_m$

- $C(TT') \cong C(T)\otimes C(T')$

<u>Disk union</u>




$\Rightarrow$ a cubical functor

$$(M' \sqcup N')(M \sqcup N) = c_{N',M} \cdot (M'M \sqcup N'N)$$