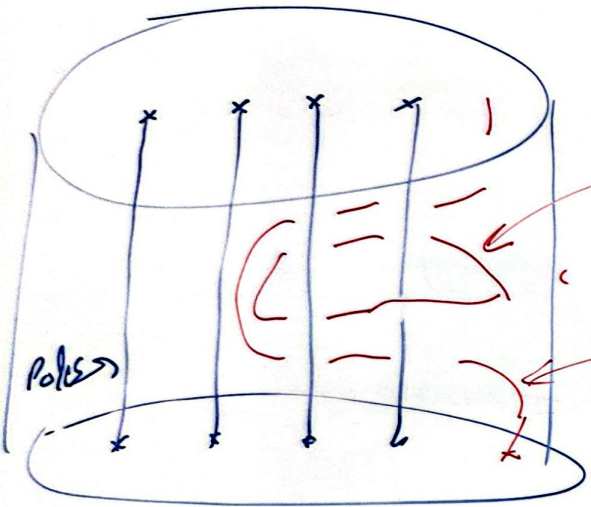


Playground



PDSy

$$Z: K \rightarrow A = \mathbb{H} \oplus \mathbb{Y}$$

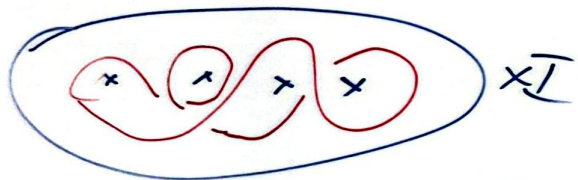
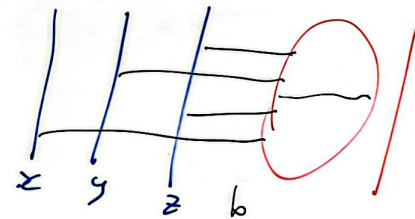
$$Z^{em}: K^{em} \rightarrow A^{em} = A / \mathbb{H} = 0 \quad \mathbb{H} = b \mathbb{H}$$

"Emergent knots"

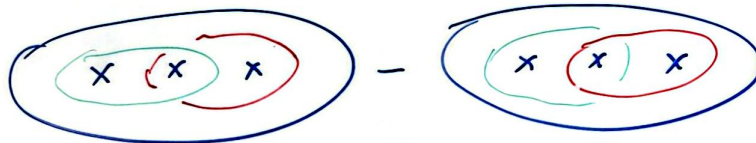
$$K / X X = 0$$

$$X = \begin{matrix} \nearrow \\ \searrow \end{matrix} - \begin{matrix} \searrow \\ \nearrow \end{matrix} = b \quad \beta = 0$$

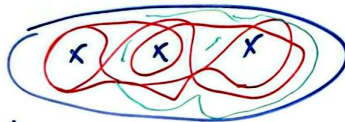
"HOMFLY" Alexander



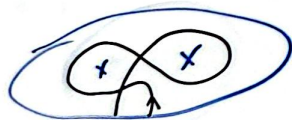
bracket



Dead knots $X = \begin{matrix} \nearrow \\ \searrow \end{matrix} - \begin{matrix} \searrow \\ \nearrow \end{matrix} = 0$

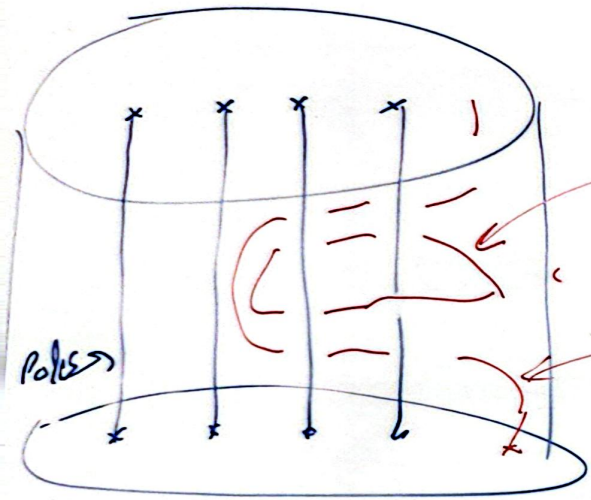


Co-bracket



$$\text{Co-bracket} = b \cdot \text{Twisted Co-bracket}$$

Playground



"Emergent knots"

strands

$$Z: K \rightarrow A = \text{HHF}$$

$$Z^{em}: A^{em} \rightarrow A^{em} = A / \begin{matrix} \text{H} \\ \text{H} \end{matrix} = 0 \quad \text{H} \uparrow = b \quad \text{H} \downarrow$$

$$K / \text{XX} = 0$$

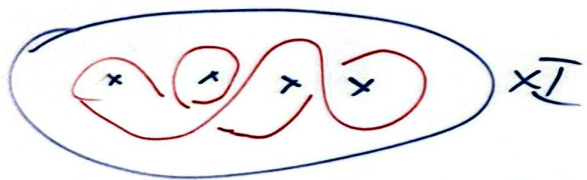
$$X = \begin{matrix} \nearrow \\ \searrow \end{matrix} - \begin{matrix} \nwarrow \\ \swarrow \end{matrix} = b$$

"HOMFLY" Alexander $\beta=0$

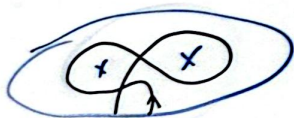
$$A^w = \text{HHF} \rightarrow \text{HHF} \rightarrow \text{FA}_p^{\oplus S^2}$$

$$A^{w,em} = \text{HHF} \rightarrow \text{FA}_p^{\oplus S} \rightarrow \text{FLP}^{\oplus S}$$

PDS₄



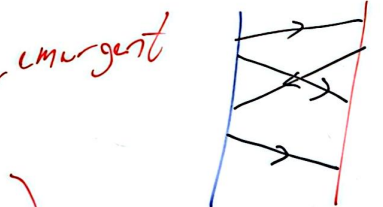
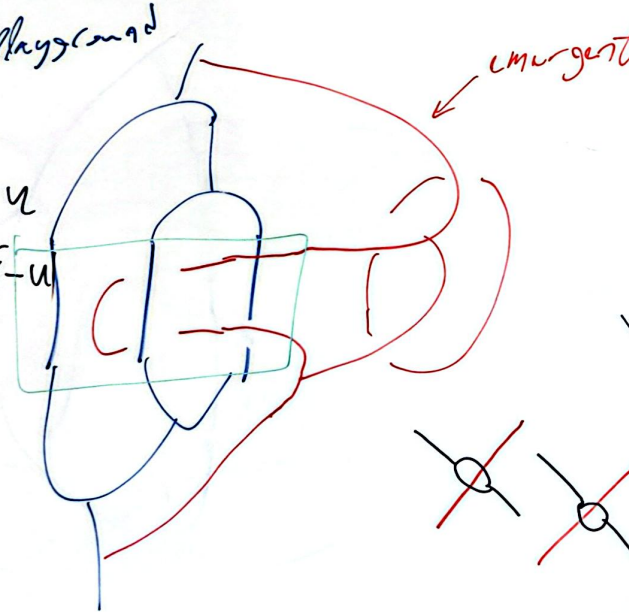
Dead knots $X = \begin{matrix} \nearrow \\ \searrow \end{matrix} - \begin{matrix} \nwarrow \\ \swarrow \end{matrix} = 0$



$$0-u \xrightarrow{a} \begin{matrix} \nearrow \\ \searrow \end{matrix} + \begin{matrix} \nwarrow \\ \swarrow \end{matrix}$$

$$0-u \text{ " } (0-v+u-u)$$

Playground

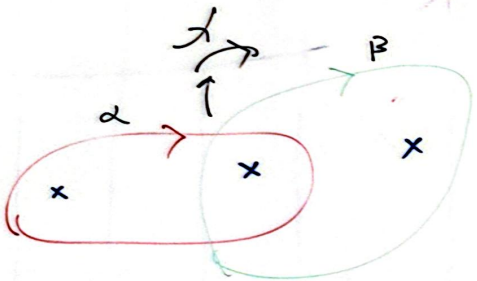


$$\begin{matrix} \nearrow \\ \searrow \end{matrix} - \begin{matrix} \nwarrow \\ \swarrow \end{matrix} = 0$$

$$U(Ig) = xxyx^*y^*z^*$$

$$[a,b] = ab - ba$$

Goldman \Leftarrow Atiyah - Bott



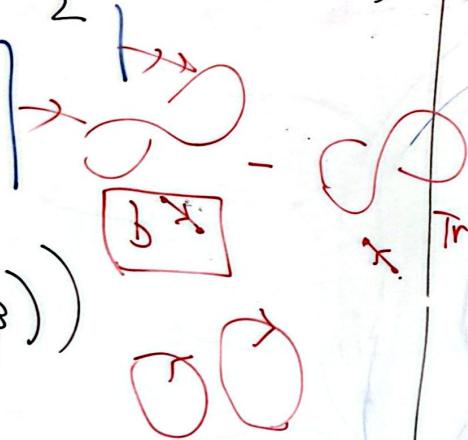
$$\omega = \int_{\Sigma} \text{Tr}(\delta A \wedge \delta A)$$

restrict to $\{A, F_A = 0\}$

$$\pi = \int_{\Sigma} \text{Tr} \left(\frac{\delta}{\delta A} \wedge \frac{\delta}{\delta A} \right)$$

$$\{ \text{Tr}(\text{Hol}(A, \alpha)), \text{Tr}(\text{Hol}(A, \beta)) \}$$

$$\sum_{p \in \alpha \cap \beta} \varepsilon_p \text{Tr}(\text{Hol}(A, \alpha \#_p \beta))$$



$$\int_{\Sigma} \text{Tr} \left(\frac{\delta}{\delta a} \frac{\delta}{\delta a^*} \right)$$

Turaev \Leftarrow ?

$$A = a + a^*$$

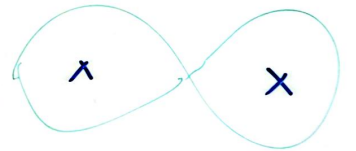
$$\begin{matrix} \mathfrak{g} & \mathfrak{g}^* \\ \oplus & \oplus \end{matrix}$$

$$\Delta(\text{Tr Hol}(A, \alpha)) =$$

$$= \sum_{p \in \alpha \cap \beta} \varepsilon_p (\text{Tr Hol}(A, \alpha'_p)) \wedge \text{Tr Hol}(A, \beta'_p)$$

$$\mathbb{I}\mathfrak{g} = \mathfrak{g} \oplus \mathfrak{g}^*$$

$$\begin{matrix} \mathfrak{g} & \mathfrak{g}^* \\ x & x^* \end{matrix}$$



$$\text{Tr Hol}(A, \alpha) = \text{Tr}(x x x^* x^* \dots x)$$

$$\mathfrak{g}(N)[\varepsilon] \cong \mathfrak{g}(N) \oplus \mathfrak{g}(N)\varepsilon$$

$$\varepsilon^2 = 1, \varepsilon = \text{odd}$$

$$a + a^* \varepsilon$$

$$\text{OTR}(a + a^* \varepsilon) := \underline{\underline{\text{Tr } a^*}}$$