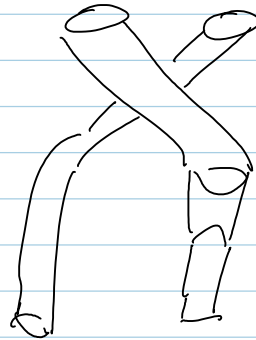


# (Khovanov-Type homology For tangles)

Tangles, Reidemeister moves, manifold with corners,  $2\text{Cob}^{\text{ext}}$

↑ things like



$$\text{EMor} \begin{pmatrix} 0 & 0 \\ \downarrow & \\ 0 & - \end{pmatrix}$$

Commutative Frobenius Algebras.

(and their relationship with  $\text{Cob}$ )

A homomorphism between Frobenius algebras.

A knowledgeable Frobenius Algebra is a quadruple:  $(\mathcal{C}, A, \tau, \tau^*)$  of two Frobs and homos going both ways. It is the algebraic gadget corresponding to  $2\text{Cob}^{\text{ext}}$

special  $2\text{Cob}^{\text{ext}}$ : Add a twist:



Jandl Algebras: have "twists"  $\curvearrowright$  that behave like or like  $e^{\otimes 2}$  in A-T.

Jandl Algebras.  
maybe Jandl structures.

The Khovanov cube of a tangle.

Thm The homology is invariant under  $R$ -moves.