A tensor category:

* Abelian, enriched over Vect
* Monoidal, $\otimes$
* Finite: Hom spaces are f.d. V.S.
  - Every object has finite length:
    $X \otimes X \otimes X \otimes \cdots$
    such sums are finitely
  - Enough projectives
  - Finitely many simple objects.
* Rigid: Every object has left & right dual,
  $\text{ev}: X \otimes^\ast X \to 1$
  $\text{coev}: 1 \to X \otimes^\ast X$

s.t.

$$ \gamma = 1 \quad \eta = 1 $$

**Thm (Etingof-Nikshych-Ostrik)**
For every tensor category, $X \to X^{**}$ is
canonically isomorphic to conjugation by some
distinguished invertible object $D \otimes$.
\[ x^{***} = D \otimes x \otimes D \]

—an analog of “Radford’s Sy formula for Hopf algebras”.

If \( \mathcal{C} \) is fusion (\( \text{semisimple} \))
then \( D \neq 1 \). I.e., \( x^{***} = x \).

Today: A new conceptual proof of the above, using higher categories.

“related to \( T(\text{iso}(3)) = \mathbb{Z}/2 \)”

“Inspired by the cobordism hypothesis”

Thm: \( \text{Fun}_g(\text{Bord}_{d+1, \mathcal{C}}) \cong \text{groupoid of commutative Frobenius algebras in } \mathcal{C} \).