Continues Beijing-2407

Knot Invariants from Finite Dimensional Integration

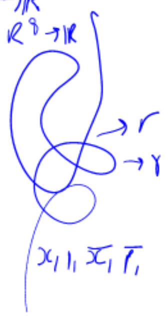
Thanks for inviting me to China!
http://drorbn.net/icbs24

Abstract. For the purpose of today, an "I-Type Knot Invariant" is a knot invariant computed from a knot diagram by integrating the exponential of a Lagrangian which is a sum over the features of that diagram (crossings, edges, faces) of locally defined quantities, over a product of finite dimensional spaces associated to those same features.

Q. Are there any such things?
A. Yes.
Q. Are they any good?
A. They are the strongest we know per CPU cycle, and are excellent in other ways too.
Q. Didn't Witten do that back in 1988 with path integrals?
A. No. His constructions are infinite dimensional and far from rigorous.
Q. But integrals belong in analysis!
A. Ours only use squeaky-clean algebra.

$\exists\ \gamma: \mathbb{R}^4 \to \mathbb{R}$, $r^{\pm}: \mathbb{R}^8 \to \mathbb{R}$

s.t.



$\longrightarrow \int_{\mathbb{R}^{28}_{x_i r_i \bar{x}_i \bar{r}_i}} \exp\left(\sum_{c\ (s,i,j)} + \sum_k\right)$ need an explain

is an invariant.

Thm as in Oaxaca

Formulas of $\gamma, r^{\pm}$.

So what? * yet another philosophy for invariants
* strongest per CPU cycle?
* Easy, despite appearances.
* Has applications to topology, may have crazy good ones (not today, but see ....)

Knots:  /R123 $\xrightarrow{\text{invariants}}$ something simple?

Knot tables in background.

The good: 1. At the center of low dim top
2. "Invariants" connect to pretty much all of algebra

The agony: 1 & 2 don't talk well to each other
* Not enough topological applications of all these invariants
* The fancy algebra doesn't come naturally to a topologist.

$\Longrightarrow$ we're still missing something about the relationship between knots & algebra