Villa de Leyva Preparations

December-07-09
8:04 PM

1. Feynman diags in $\mathbb{R}^n$.
2. Chern-Simons.
3. F.T invts, UFTI, $\mathcal{A}^c \cong \mathcal{A}^t$
4. $\longrightarrow$ Associators, KTGs.
5. WTT
6. v-knots?

Tentative title: From Feynman diagrams to quantum algebra without looking back. (?)

Maybe: "From Feynman Diagrams to Quantum Algebra: A First Person Narrative".

Maybe: "Expansions - a loosely tied traverse (?) from Feynman diagrams to quantum algebra"

Abstract. Assuming lots of luck, in six classes we'll talk about

1. Perturbed Gaussian integration in R^n and Feynman diagrams.
2. Chern-Simons theory, knots, holonomies and configuration space integrals.
3. Finite type invariants, chord diagrams and Jacobi diagrams and "expansions".
4. Drinfel'd associators and knotted trivalent graphs.
5. w-Knotted objects and co-commutative Lie bi-algebras.
6. Virtual knots and all other Lie bi-algebras.

Each class will be closely related to the next, yet the first and last will only be very loosely connected.

Perhaps in the introduction of Feynman diagrams, the right thing to do is to get to the formula

$$I_m \propto \left(\sum \lambda^{ijk} \frac{\partial}{\partial p_i}\frac{\partial}{\partial p_j}\frac{\partial}{\partial p_k}\right) e^{-\frac{1}{2}\lambda^{ij} p_i p_j}\Big|_{p=0}$$

and then write

<u>Theorem</u>. The result is a sum of "Feynman diagrams"

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Proof ......