

<p>Witten Chern-Simons</p> <p>u-knots</p> <p>u-knots are usual knots:</p> <p>=PA $\langle \text{R}\times\text{23} \rangle_{0 \text{ legs}}$ </p> <p>"Knots in \mathbb{R}^3"</p>	<p>$1-1 \rightarrow$</p> <p>v-knots</p> <p>v-knots are virtual knots:</p> <p>=PA $\langle \text{R}\times\text{23} \text{ VR1} \rangle_M$</p> <p>=CA $\langle \text{R}\times\text{23} \rangle_0$ </p> <p>= Knots on surfaces, modulo stabilization:</p>	<p>$\text{orto} \rightarrow$</p> <p>w-knots</p> <p>w is for welded, weakly v, and warmup:</p> <p>4 $\{w\text{-knots}\} = \{v\text{-knots}\} / (\text{OC})$</p> <p>where OC is Overcrossings Commute:</p> <p>Related to "movies of flying rings" to knotted tubes in 4-space, and to "basis conjugating automorphisms of free groups".</p> <p>McCool Goldsmith Fern Rimanyi Rourke Satoh Brendle Hatcher</p>
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<p>$\mathcal{K}^u \xrightarrow{\quad} \mathcal{K}^v \xrightarrow{\quad} \mathcal{K}^w$</p> <p>Expansion exists, Eg., using the Kontsevich integral.</p> <p>No homomorphic expansion!</p> <p>$\downarrow Z^u$</p> <p>\mathcal{A}^u</p> <p>4T:</p>	<p>wide open</p> <p>$\downarrow Z^v$</p> <p>\mathcal{A}^v</p> <p>6T:</p>	<p>Homomorphic Z^w exists!</p> <p>$\downarrow Z^w$</p> <p>\mathcal{A}^w</p> <p>TC: </p> <p>$\overline{4T}$:</p>
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<p>$\downarrow \mathcal{Z}^u$</p> <p>$U(\mathfrak{g})^{\otimes \mathbb{C}}$</p> <p>For any metrized f.d. Lie algebra \mathfrak{g}</p>	<p>$\downarrow \mathcal{Z}^v$</p> <p>$U(\mathfrak{g}_+ \oplus \mathfrak{g}_-)^{\otimes \mathbb{C}}$</p> <p>For any f.d. Lie bialgebra $\mathfrak{g} = \mathfrak{g}_+ \oplus \mathfrak{g}_-$</p>	<p>$\downarrow \mathcal{Z}^w$ Today</p> <p>$U(\Gamma \mathfrak{g})^{\otimes \mathbb{C}}$</p> <p>For any f.d. Lie algebra \mathfrak{g}</p>
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