

<p>Written Chern-Simons</p> <p><b>u-knots</b></p> <p>u-knots are usual knots:</p> <p>=PA <math>\langle \text{R}^{\times 23} \rangle_0</math> legs "Knots in <math>\mathbb{R}^3</math>"</p>	<p><math>1-1 \rightarrow</math></p> <p><b>v-knots</b></p> <p>v-knots are virtual knots:</p> <p>=PA <math>\langle \text{R}^{\times 23} \text{VR1} \text{VR2} \rangle_0</math> =CA <math>\langle \text{R}^{\times 23} \rangle_0</math> = Knots on surfaces, modulo stabilization:</p>	<p><math>\text{onto} \rightarrow</math></p> <p><b>w-knots</b></p> <p>w is for welded, weakly v, and warmup:</p> <p>4 <math>\{w\text{-knots}\} = \{v\text{-knots}\} / (\text{OC})</math> where OC is Overcrossings Commute:</p> <p>yet <math>\neq</math> UC</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 Fenn Rimanyi Rourke Satoh Brendle Hatcher</p>
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$\mathcal{K}^u$	$\rightarrow$	$\mathcal{K}^v$	$\rightarrow$	$\mathcal{K}^w$
<p>Expansion exists, Eg., using the Kontsevich integral.</p> <p>No homomorphic expansion!</p>	<p>wide open</p>	<p>Homomorphic <math>\mathbb{Z}^v</math> exists!</p>	<p>Homomorphic <math>\mathbb{Z}^w</math> exists!</p>	
$\downarrow \mathbb{Z}^u$		$\downarrow \mathbb{Z}^v$		$\downarrow \mathbb{Z}^w$
$\mathcal{A}^u$	$\rightarrow$	$\mathcal{A}^v$	$\rightarrow$	$\mathcal{A}^w$
$\langle \text{ } \rangle_{4T}$	$\langle \text{ } \rangle_{6T}$	$\langle \text{ } \rangle_{TC}$	$\langle \text{ } \rangle_{\overline{4T}}$	$\langle \text{ } \rangle_{\overline{4T}}$
<p>4T:</p>	<p>6T:</p>	<p>TC:</p>	<p><math>\overline{4T}</math>:</p>	

$\downarrow \mathcal{U}^u$	$\downarrow \mathcal{U}^v$	$\downarrow \mathcal{U}^w$ <span style="color: yellow;">Today</span>
$U(\mathfrak{g})^{\otimes \mathbb{C}}$	$U(\mathfrak{g}_+ \oplus \mathfrak{g}_-)^{\otimes \mathbb{C}}$	$U(\mathbb{I}\mathfrak{g})^{\otimes \mathbb{C}}$
<p>For any metrized f.d. Lie algebra <math>\mathfrak{g}</math></p>	<p>For any f.d. Lie bialgebra <math>\mathfrak{g} = \mathfrak{g}_+ \oplus \mathfrak{g}_-</math></p>	<p>For any f.d. Lie algebra <math>\mathfrak{g}</math></p>