Meta–Groups, Meta–Bicrossed–Products, and the Alexander Polynomial, 1

Dror Bar–Natan at Knots in Washington XXXIV
http://www.math.toronto.edu/~drorbn/Talks/GWU-1203/
Foots & refs on PDF version

Abstract. A straightforward proposal for a group-theoretic invariant of knots fails if one really means groups, but works once generalized to meta-groups (to be defined). We will construct one complicated but elementary meta-group as a meta-bicrossed-product (to be defined), and explain how the resulting invariant is a not-yet-understood generalization of the Alexander polynomial, while at the same time being a specialization of a somewhat-understood "universal finite type invariant of w-knots" and of an elusive "universal finite type invariant of v-knots".

Knot diagram

8_{17}

Tangle diagram

Knot/tangle invariant

$Z: \{\text{knots} / \text{tangles}\} \longrightarrow$ easy set

s.t. $Z(\ldots) = Z(\ldots), \ldots$

grayed out.

Idea. Group G $\quad R^p = (g_a\, g_b) \quad R^m = (g'_a\, g'_b)$

$\longrightarrow \in G$

$\to g_a g'_a = 1 = g_b g'_b \quad$ So $' = {}^{-1}$

$\mapsto R^p_{16} R^p_{24} R^p_{53} = (g_a \quad g_b) \ldots$

$\xrightarrow{m^{14} m \ldots} (\quad)$

Define meta-group

Example (matrices) row & col. ops.

Bicrossed Products

meta Bicrossed prod.

$\beta(H, T)$

& ops

Program

& comps.

what is it good for

where is it coming from.