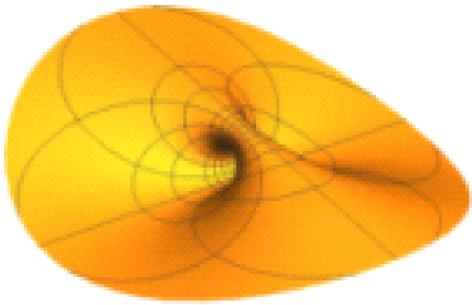
Dancso visit summary

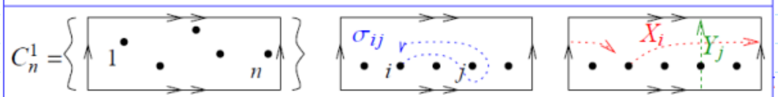
January 5, 2017 8:30 AM

Some genus g excerpts:

(131104) Humbert's thesis pp 22: The relations of t_n^1: $[v_i, w_j] = \langle v, w\rangle t_{ij}$, $[v_i, t_{jk}] = 0$, $[x_i, y_i] = -\sum_{j\neq i} t_{ij}$. Imply centrality of $\sum_j v_j$ and $t_{ij} = t_{ji}$, $[v_i + v_j, t_{ij}] = 0$, $[t_{ij}, t_{kl}] = 0$, and $[t_{ij}, t_{ik} + t_{jk}] = 0$. Canonical forms?

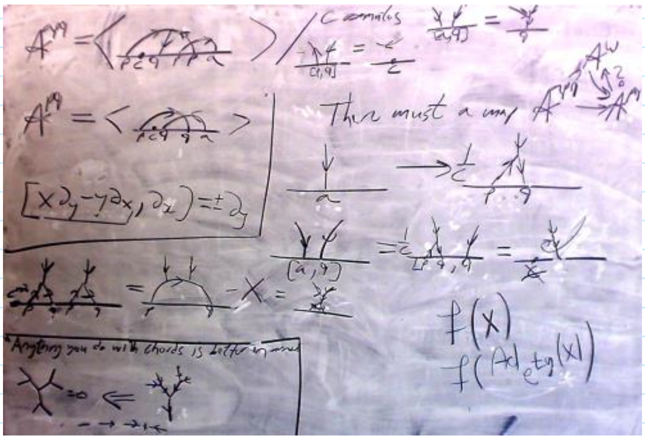
(150217) Enriquez: B_n^1 is $\langle \sigma_i, X_1^\pm\rangle$ mod $(\sigma_1^{\pm 1} X_1^\pm)^2 = (X_1^\pm \sigma_1^{\pm 1})^2$, $[X_1^\pm, \sigma_i] = 1$ for $i \geqslant 2$, $[X_1^-, (X_2^+)^{-1}] = \sigma_1^2$, $X_1^\pm \cdots X_n^\pm = 1$, and braid relations, where $X_{i+1}^\pm = \sigma_i^{\pm 1} X_i^\pm \sigma_i^{\pm 1}$.





Elliptic Braids. $PB_n^1 := \pi_1(C_n^1)$ is generated by σ_{ij}, X_i, Y_j, with PB_n relations and $(X_i, X_j) = 1 = (Y_i, Y_j)$, $(X_i, Y_j) = \sigma_{ij}^{-1}$, $(X_i X_j, \sigma_{ij}) = 1 = (Y_i Y_j, \sigma_{ij})$, and $\prod X_i$ and $\prod Y_j$ are central. [Bez] implies $\mathcal{A}(PB_n^1) = \langle x_i, y_j \rangle / \left([x_i, x_j] = [y_i, y_j] = [x_i + x_j, [x_i, y_j]] = [y_i + y_j, [x_i, y_j]] = [x_i, \sum y_j] = [y_j, \sum x_i] = 0,\ [x_i, y_j] = [x_j, y_i]\right)$, and [CEE] construct a Taylor expansion using *sophisticated* iterated integrals. [En2] relates this to *Elliptic Associators*.

Comment. There might be good related stuff hidden in Kricker's papers and blackboard shots! Especially,



(150224b) Fadell-Neuwirth: For $0 < r < n$, $m \geqslant 0$, and $M = \Sigma^2_{g\geqslant 1} \mid D^2$, $1 \to PB_{n-r}(M \setminus \underline{m+r}) \to PB_n(M \setminus \underline{m}) \to PB_r(M \setminus \underline{m}) \to 1$ is exact.

(150224a) Surface braids: Bardakov, Bellingeri, Birman, Funar, Gervais, Gonzalez-Meneses, Guaschi, Juan-Pineda.

(150131) Katz 5.1: $R\mathcal{A}^s(|_h \uparrow^n) \hookrightarrow \mathcal{A}^s(|_h \uparrow^n)/C$. R: nothing on last strand. $|_h$: a handle line.

(150130b) Katz 5.2: $L\mathcal{A}_1^{s\curlywedge}(\uparrow^n) \cong \mathcal{A}_1^{s\curlywedge}(\uparrow^n)/C$. $\square_1$: elliptic. $\curlywedge$: strutless. s: skeleton-connected. L: only lonely vertices on last strand. C: closed surface.

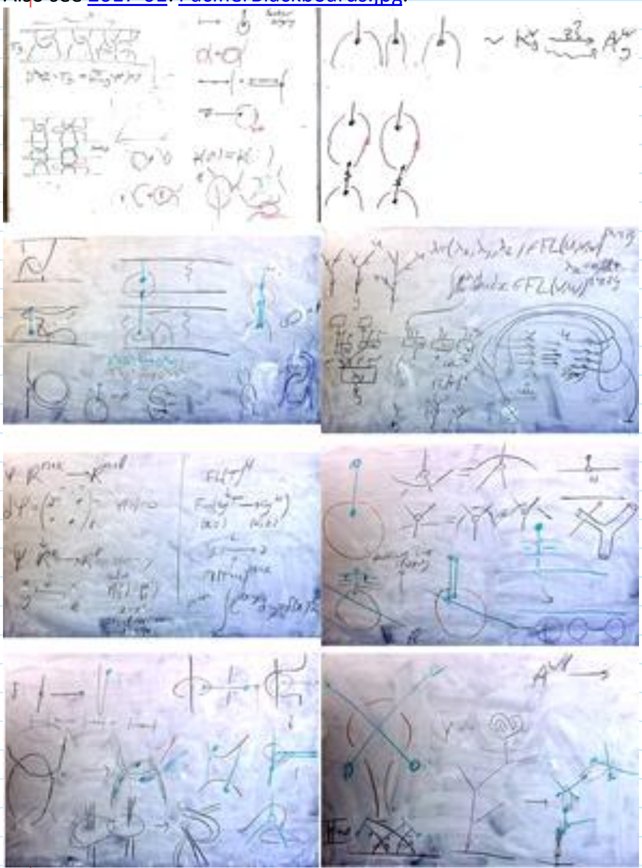
(150130a) **Q.** Why is PB^g related to non-tangential differential operators on $\mathrm{Fun}(\mathfrak{g}^g)$?

(141224) Katz points (BBS:Katz-141224, arXiv:1412.7848): • Cheptea-Habiro-Massuyeau's arXiv:math/0701277 has a Clifford-like relation in sec. 8 (earlier, in Habiro's arXiv:math/0001185, fig. 48). • LMO for Lagrangian cobordisms partially interprets leg-gluing in $\mathcal{B}$. • $\mathcal{B}^g$-grading: # of trivalent vertices (excluding univalents).

(150123) gr $\left(PB_n^0 \to PB_n^1\right)$ is 0: $\mathcal{A}^{pb,0} \to \mathcal{A}^{pb,1}$ for a degree mismatch. Likely $[PB_n^1, PB_n^1] \supsetneq PB_n^0$.

(131112b) A map $\mathcal{A}^w(\uparrow \updownarrow) \to \mathcal{A}^u(\uparrow \circledast)$ arises in deducing wheeling from the full Duflo (not α^{-1} for α is not well-defined!?); There's a pairing $\mathcal{A}^w(\uparrow\updownarrow) \otimes \mathcal{A}^u(\uparrow) \to \mathcal{A}^u(\uparrow)$. Topological meaning?

Also see 2017-01: PacifierBlackboards.jpg:



Also see http://drorbn.net/bbs/show?prefix=Dancso:

170105-141938: A map $\mathcal{A}^v \to \mathcal{A}^{pq}$.
170105-100835: 1 + 1 = 2 mysteries with $u \to w$.
170105-094939: Low algebra in genus g (3).
170105-094433: Low algebra in genus g (2).
170105-093719: Low algebra in genus g.
170104-152331: A tentative $\mathcal{A}^w_g$ theorem.
170104-150649: Elliptic braids.
170104-135319: Surgeries and pacifiers (3).
170104-104648: Surgeries and pacifiers (2).
170103-173628: Surgeries and pacifiers.
170103-142352: 1 + 1 = 2 in w (2).
170102-160853: 1 + 1 = 2 in w.

Idea for a (modest) paper (which should at least serve to motivate us to complete the statement and proof of the "w-genus g" theorem of http://drorbn.net/bbs/show?shot=Dancso-170104-152331.jpg):

Title. Finite type invariants of certain 2-knots in certain 4-manifolds.

Abstract. We construct a homomophic expansion (a universal finite type invariant) for a certain class of 2-knots in a certain class of 4-manifolds (details and small print inside), using some novel techniques which include certain 4D surgeries and a related "Aarhus integral", and a certain diagrammatic analog of Heisenberg algebras. Almost certainly, this paper will not be interesting in the long term, as it is clear that our results should be subsumed within a higher level of understanding of 2D in 4D and of w-knot and v-knot techniques. Yet to gain this higher level understanding we must start somewhere, and right now, this is here.

Some after-visit thoughts are in monoblog.

We should hear Alekseev's talk at MSRI, and read https://arxiv.org/abs/1611.05581. Also some LD16 talks.