

Mapping Class Groups of Infinite-Type Surfaces

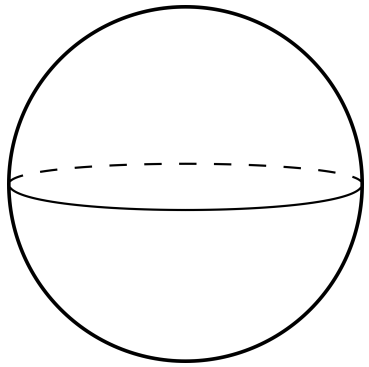
Santana Afton and Samuel Freedman

The College of William & Mary, University of Michigan

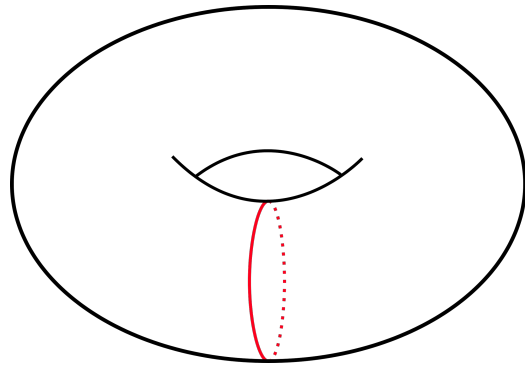
Outline

- Finite-Type Surfaces
- Infinite-Type Surfaces
- Symmetries
- Symmetries of Surfaces

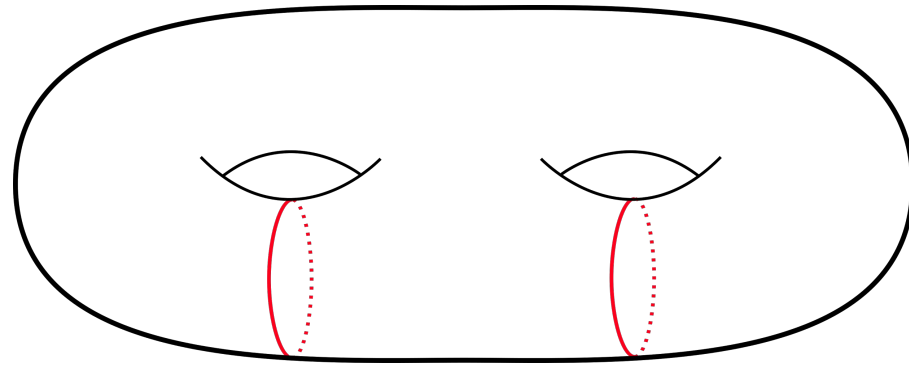
Finite-Type Surfaces



Sphere



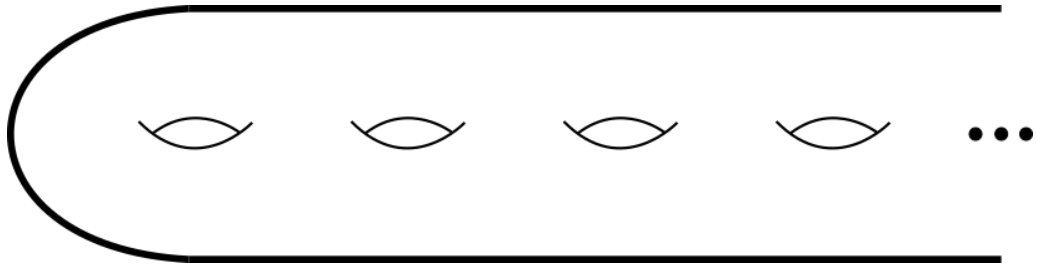
Torus



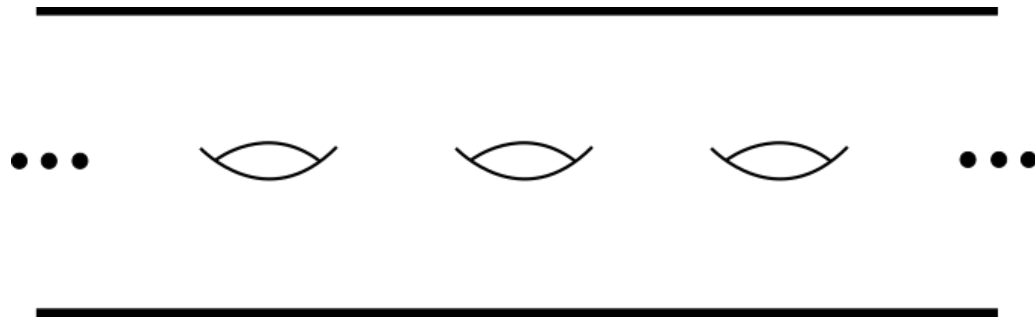
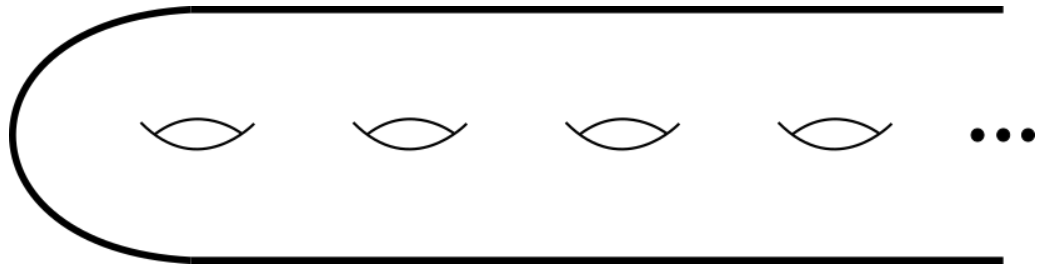
2-holed Torus



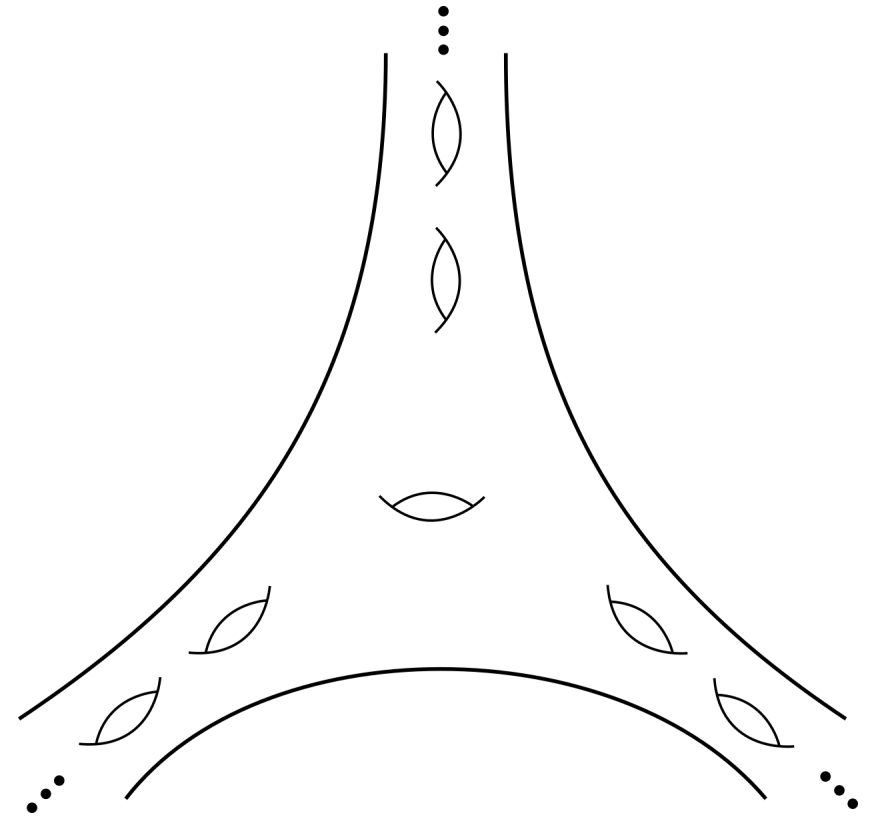
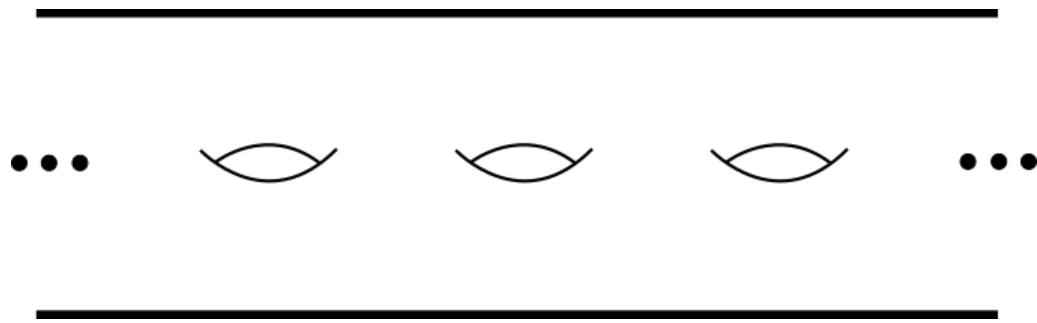
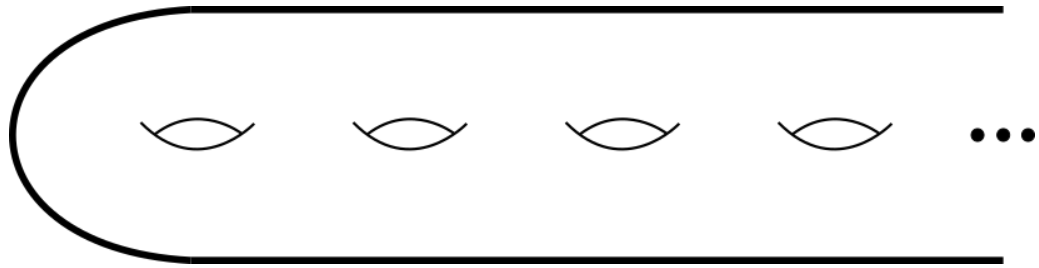
Infinite-Type Surfaces



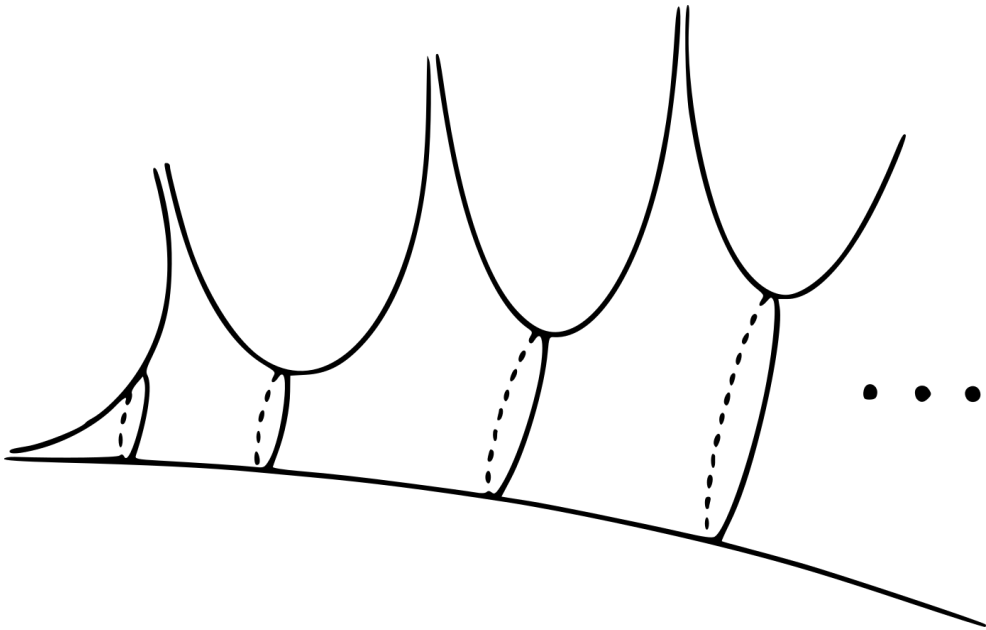
Infinite-Type Surfaces



Infinite-Type Surfaces

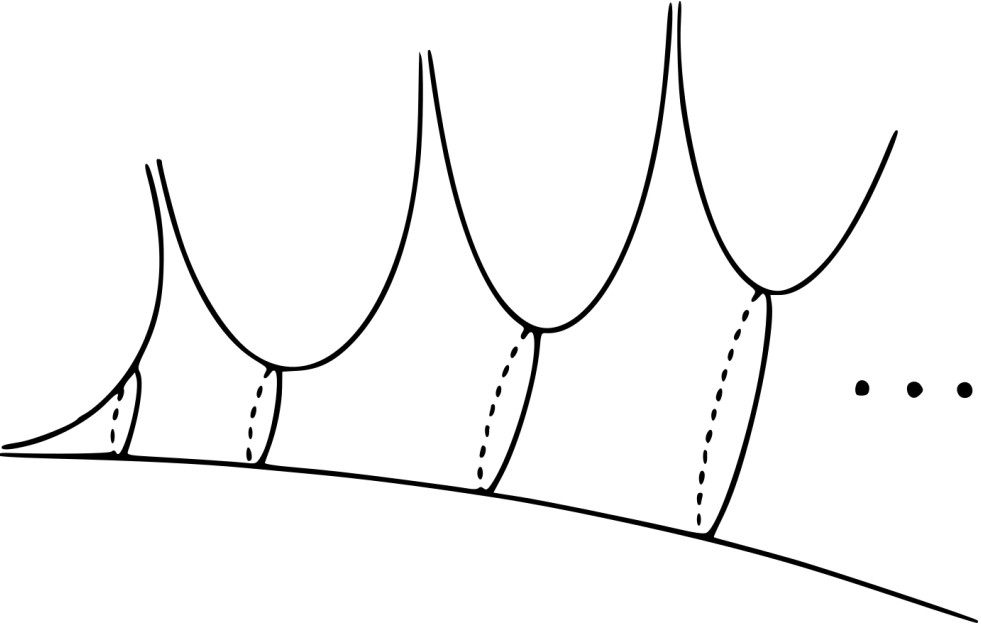


Infinite-Type Surfaces

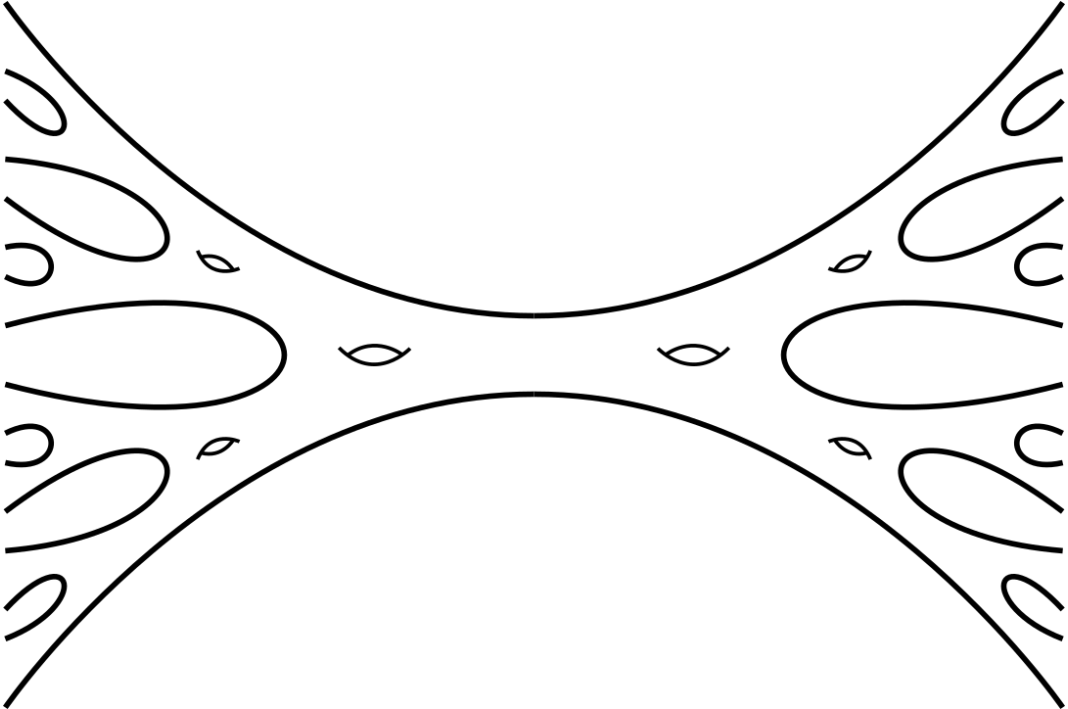


The Flute Surface

Infinite-Type Surfaces

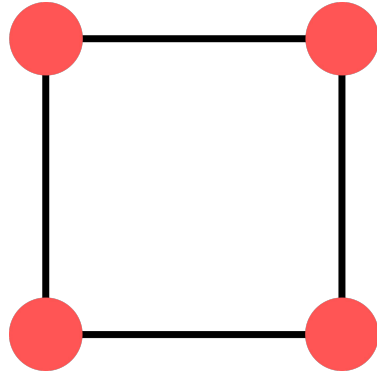


The Flute Surface

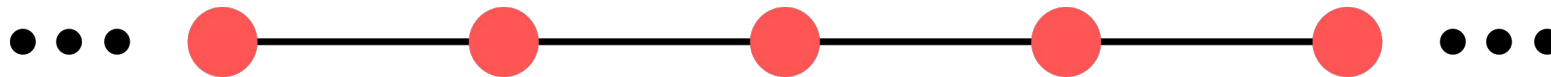
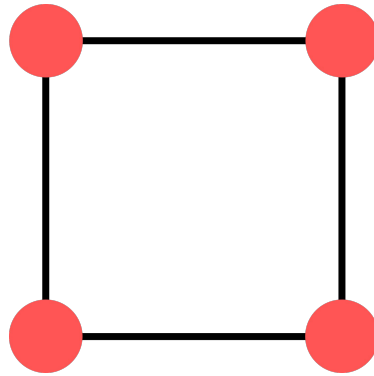


The Blooming Cantor Tree

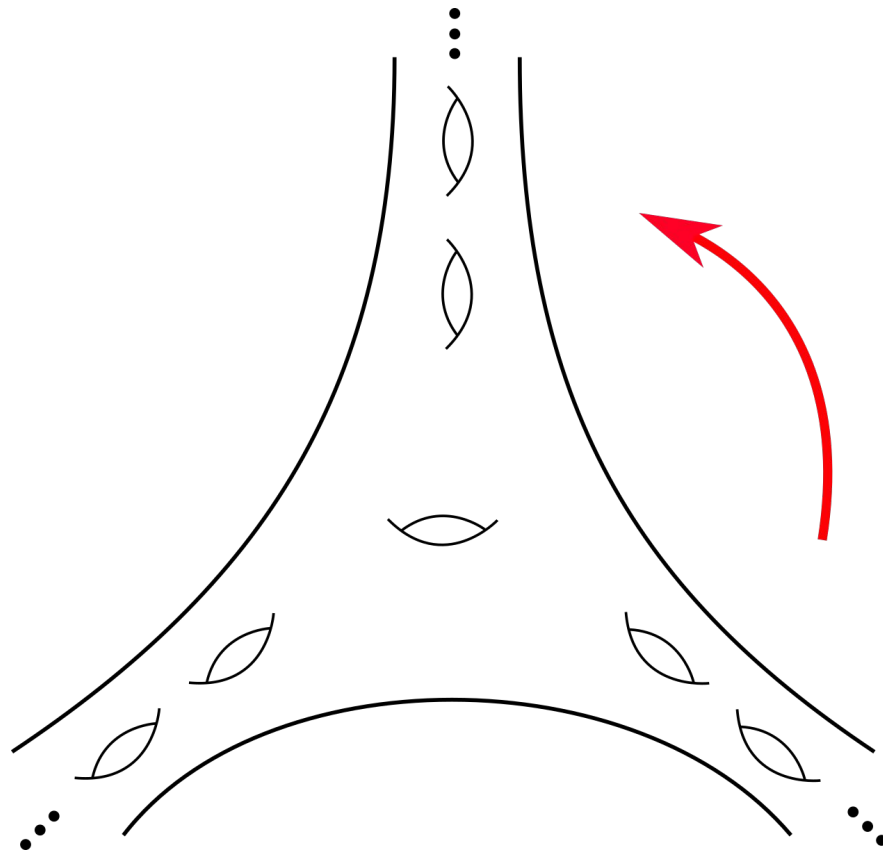
What is Symmetry?



What is Symmetry?

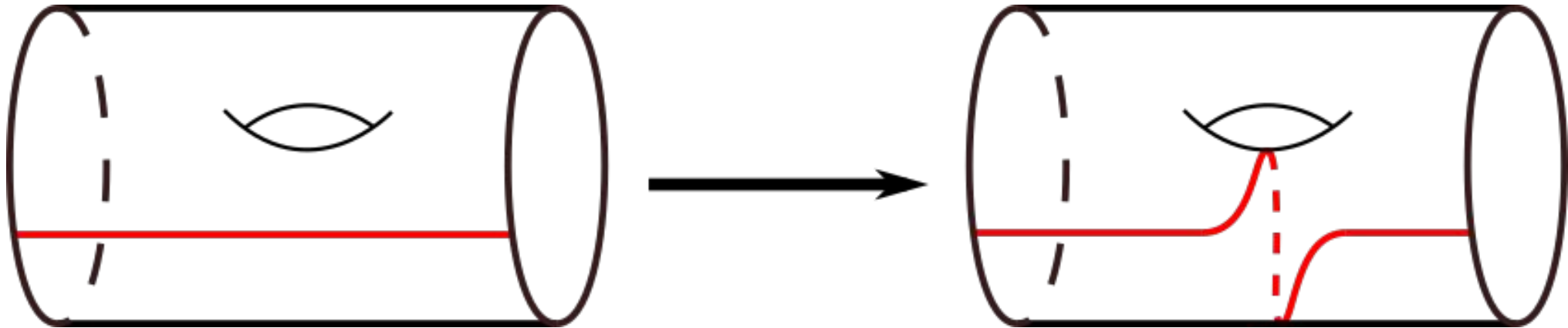


Mapping Classes



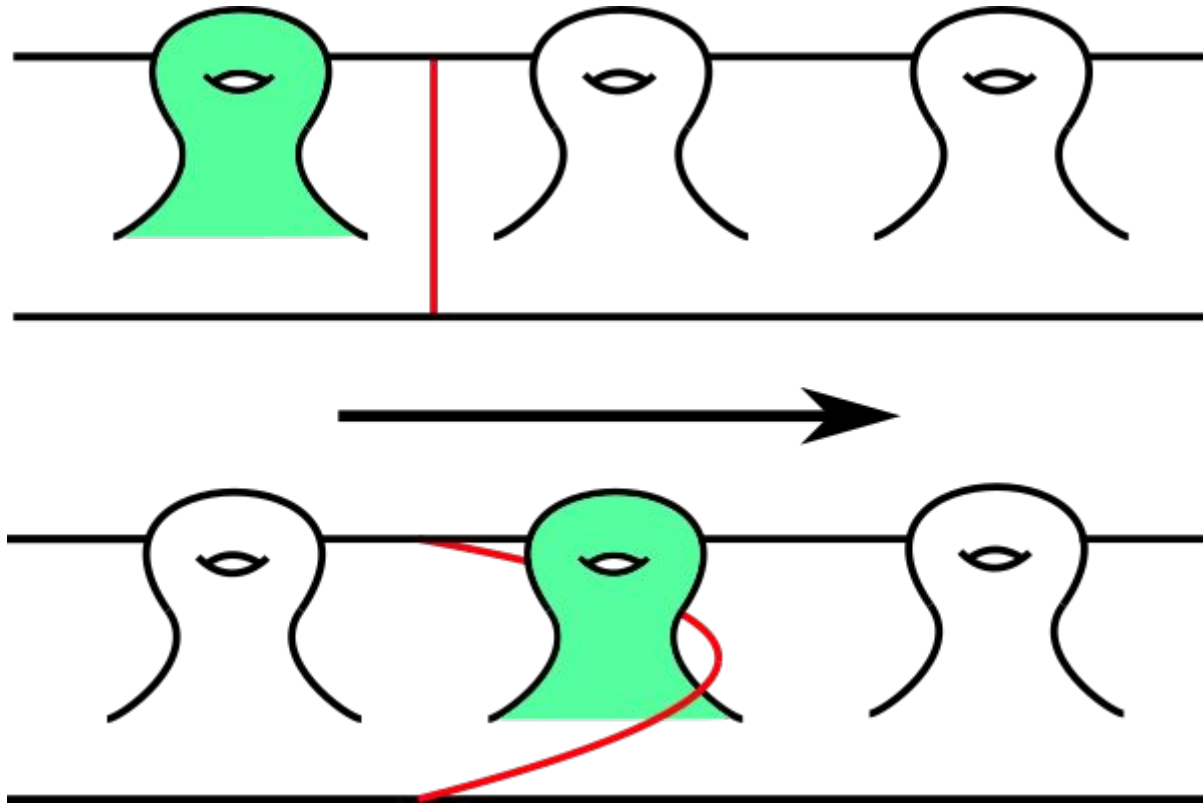
Rotation

Mapping Classes



Dehn Twist

Mapping Classes

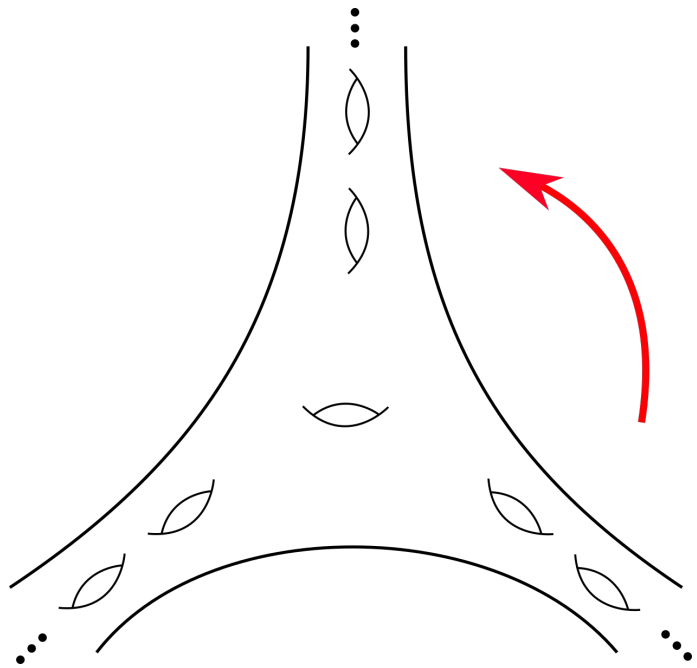


Handle Shift

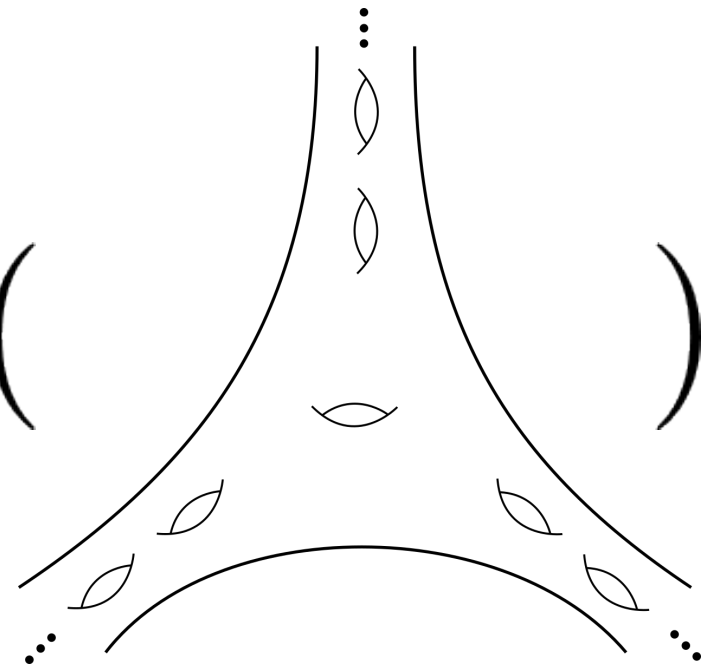
Mapping Class Group

$$\text{Mod}(\mathcal{S}) := \text{Homeo}^+(\mathcal{S}, \partial\mathcal{S}) / \text{homotopy}$$

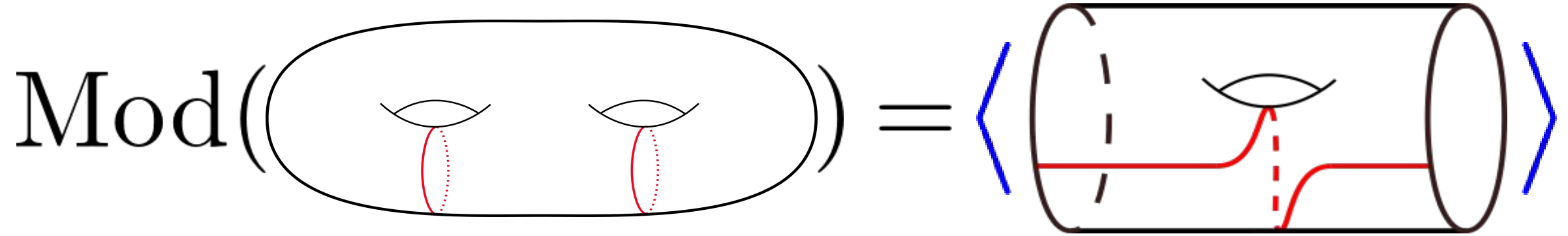
Mapping Class Group: History



$\notin \text{PMod}(\quad)$



Mapping Class Group: History

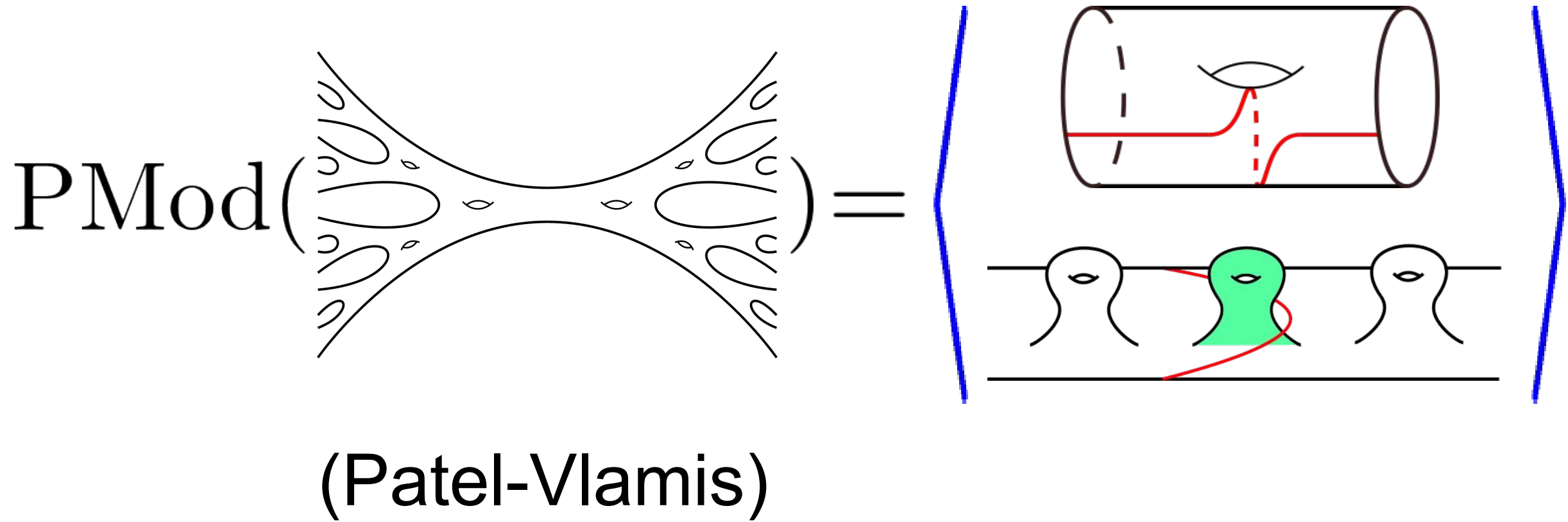
$$\text{Mod}(\text{torus}) = \langle \text{cylinder} \rangle$$


(Dehn)

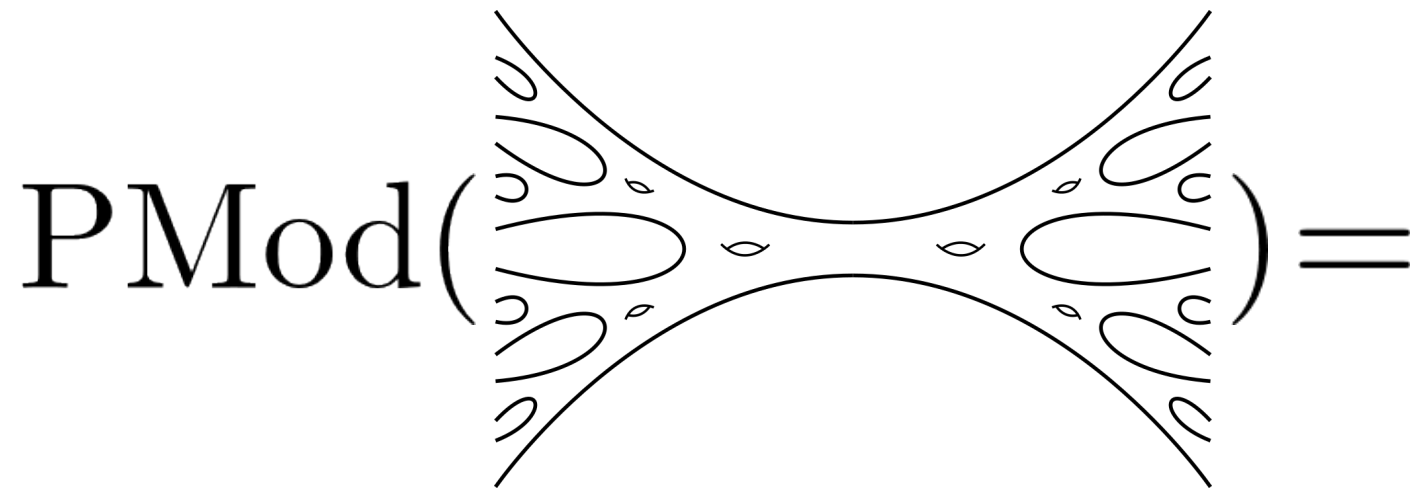
Mapping Class Group: History

$$\text{PMod}(\text{pair of pants}) = \langle \text{cylinder}, \text{pants} \rangle$$

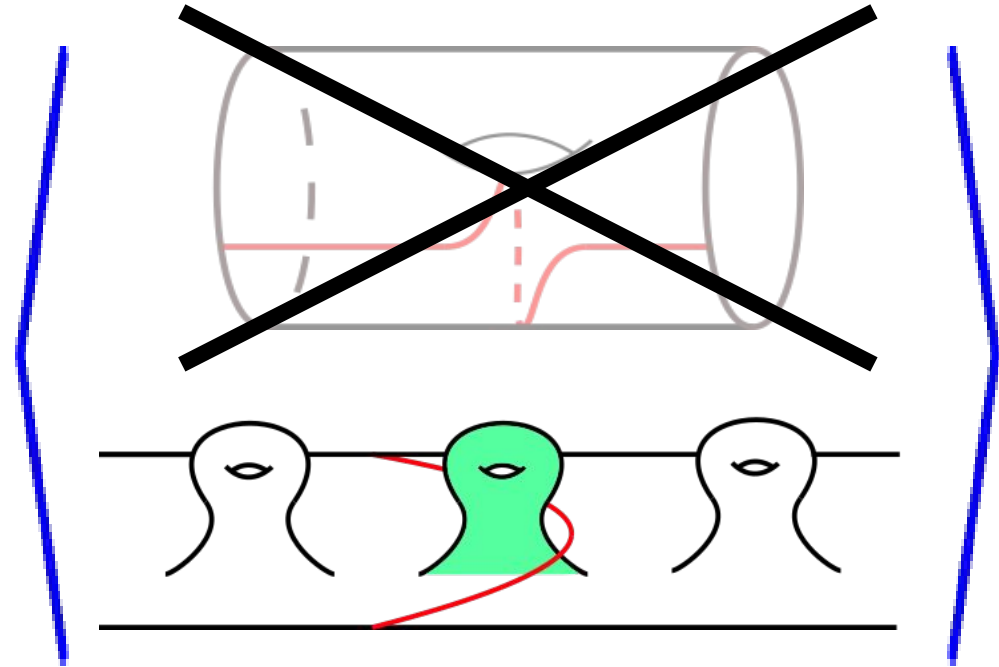
(Patel-Vlamis)



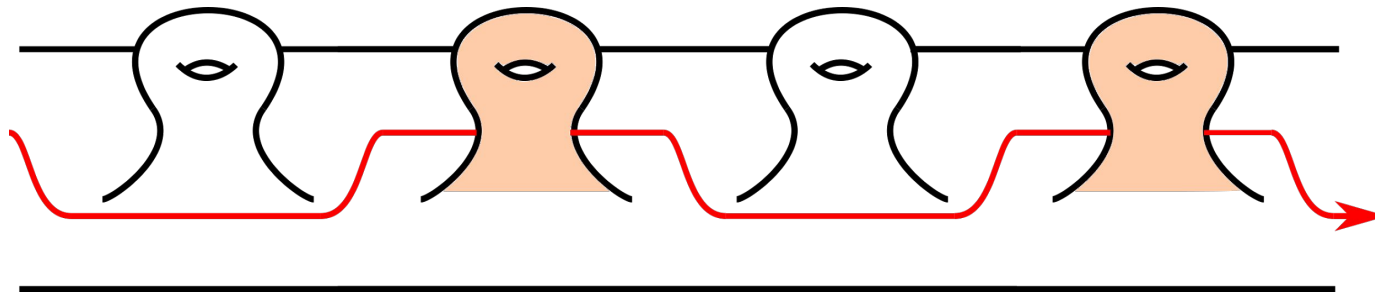
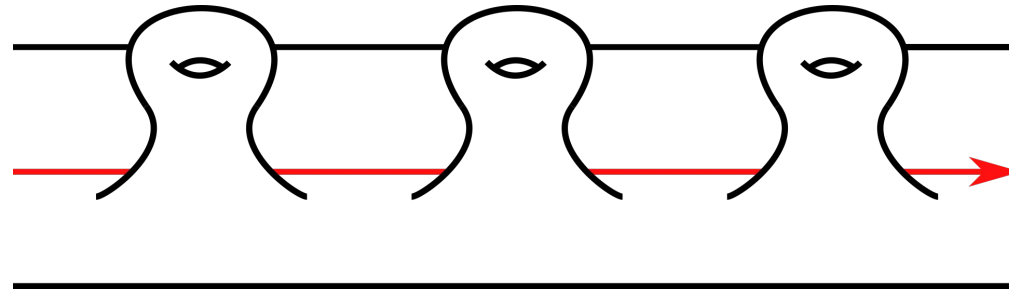
Mapping Class Group: History



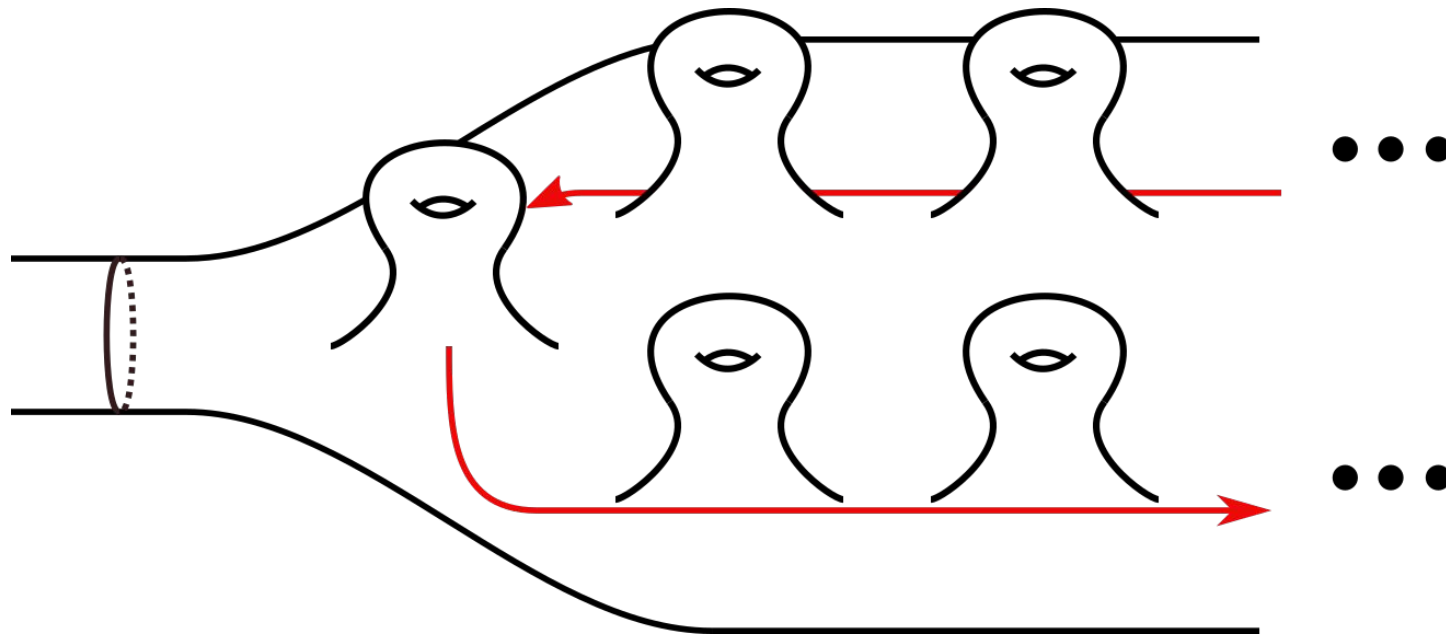
(AF)



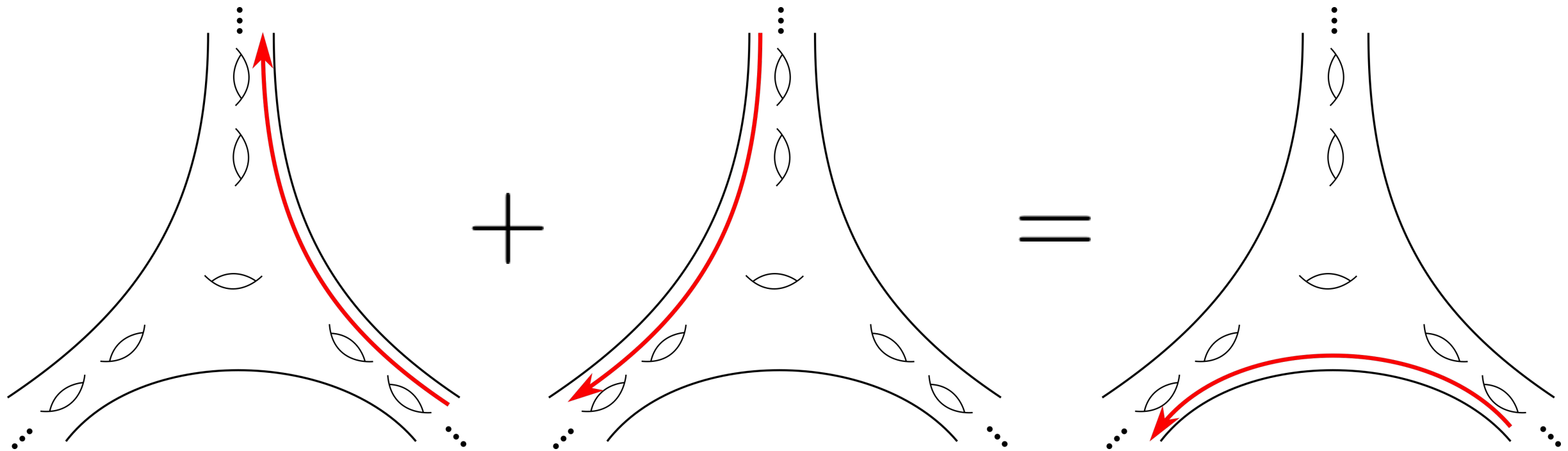
Classes of Handle Shifts



One-Ended Handle Shifts



Handle Shifts - Relations



Acknowledgements and Citations

Thanks to:

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Dr. Nick Vlamis

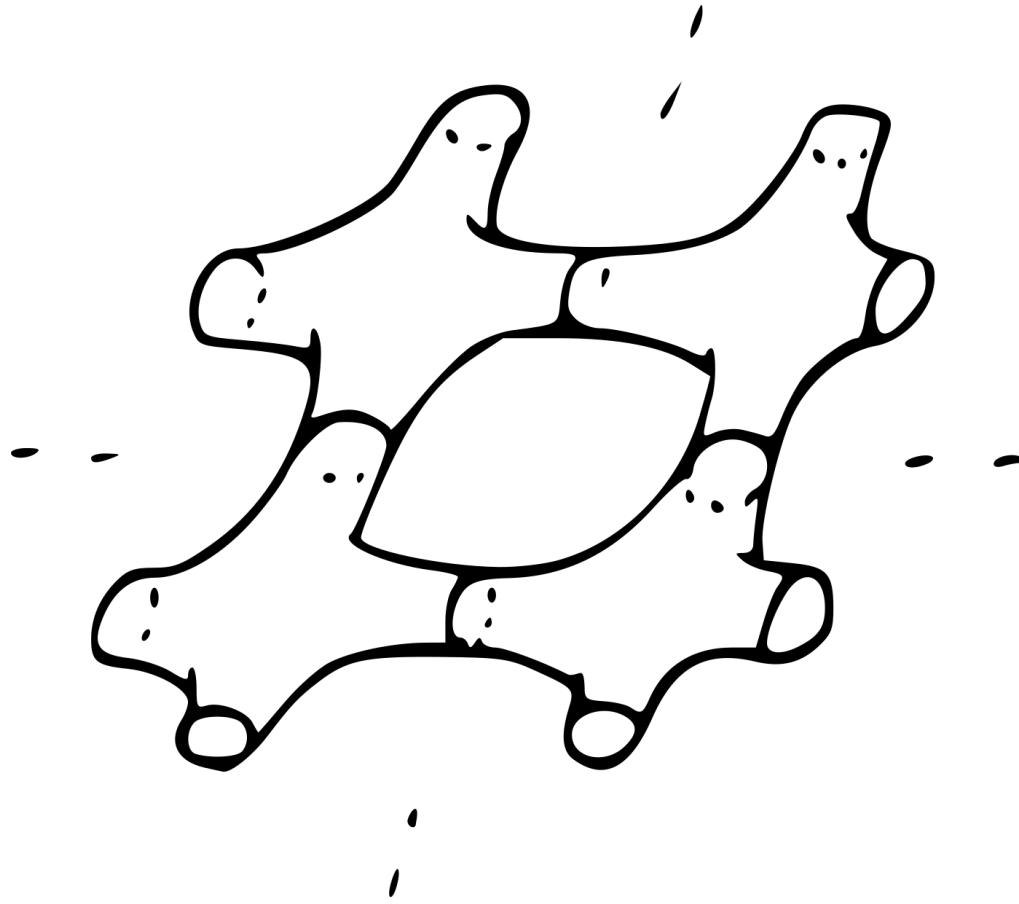
Basmajian, Ara. "Hyperbolic structures for surfaces of infinite type." *Transactions of the American Mathematical Society* 336.1 (1993): 421-444.

Farb, Benson, and Dan Margalit. *A Primer on Mapping Class Groups (PMS-49)*. Princeton University Press, 2011.

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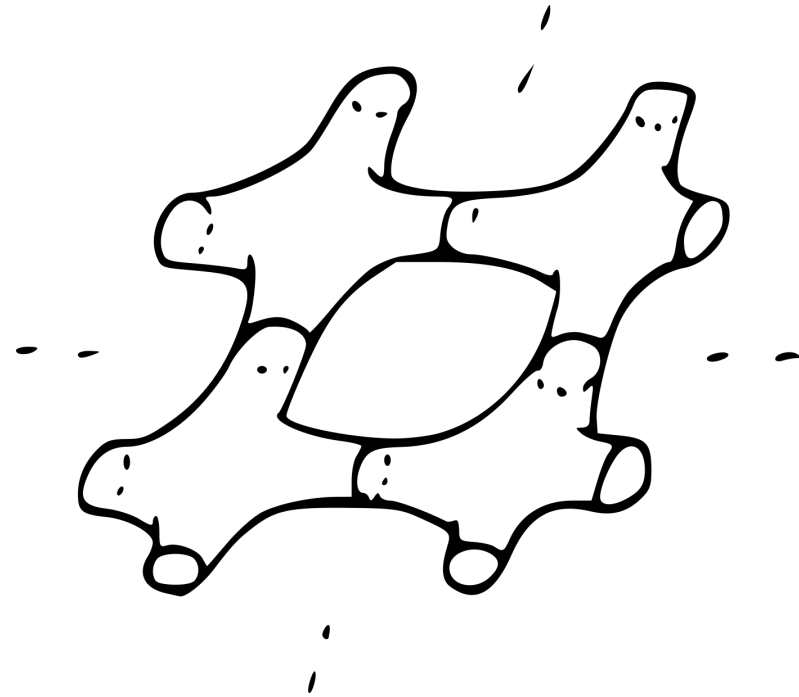
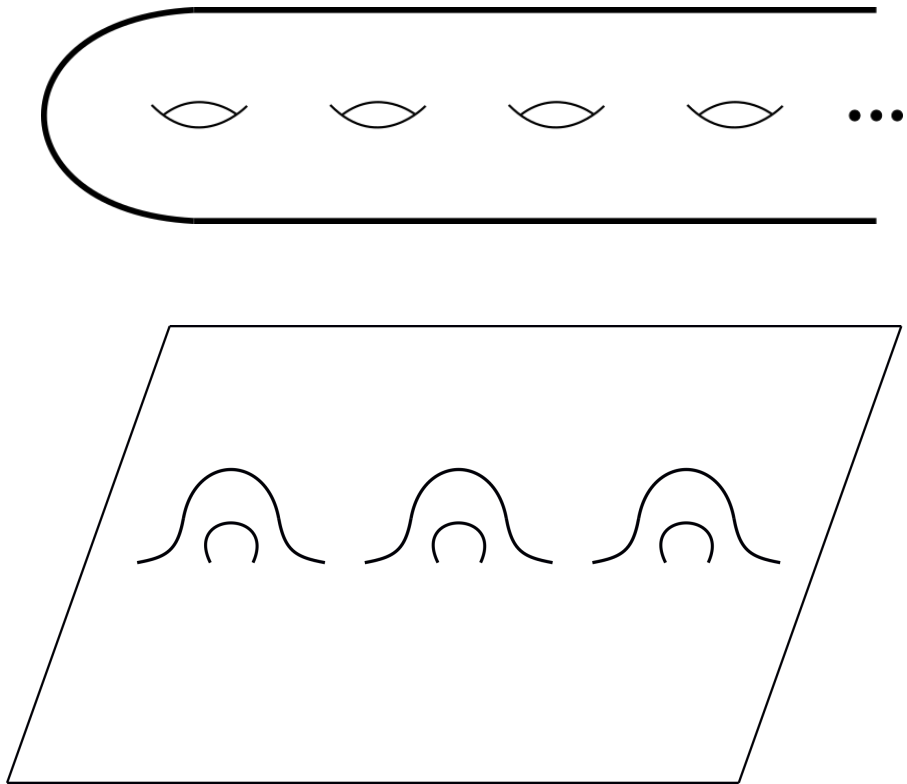
Richards, Ian. "On the classification of noncompact surfaces." *Transactions of the American Mathematical Society* 106.2 (1963): 259-269.

Questions?

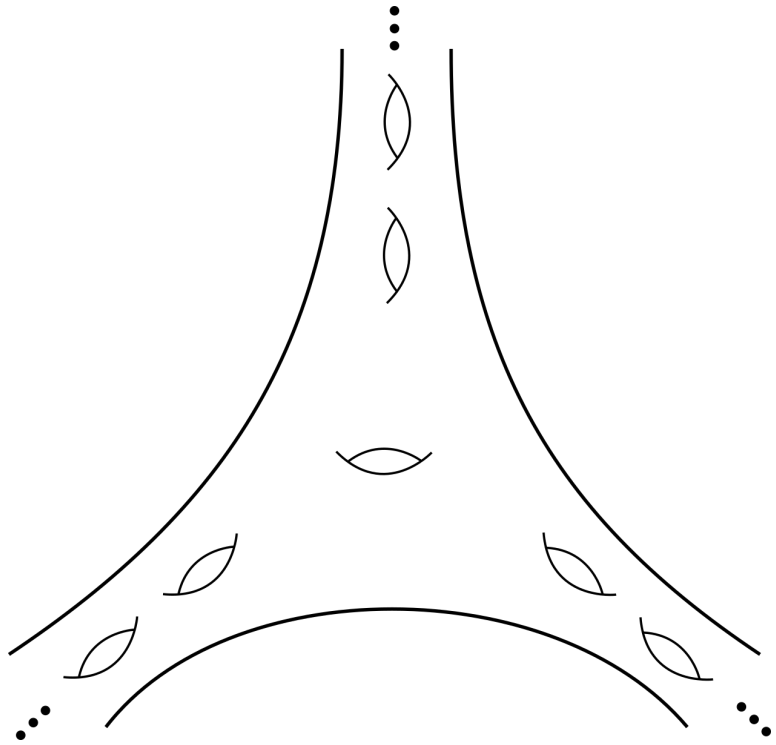


Infinite jail cell window

What *is* the Loch Ness Monster?



Stacks of Waffles



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