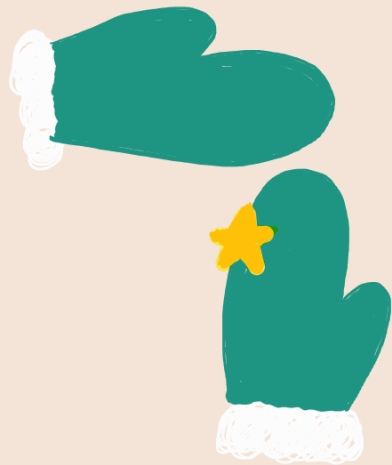


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$$\dots < f^2 < f^{-1} < 1 < f < f^2 < \dots$$

Knots / links

3-mfds

mapping class  
groups

open book  
decompositions

4-mfds

Contact structures  
on 3-mfds

Heegaard  
Floor  
L-spaces

left-ordered  
"geometric"  
groups

fractional Dehn  
twist coefficient

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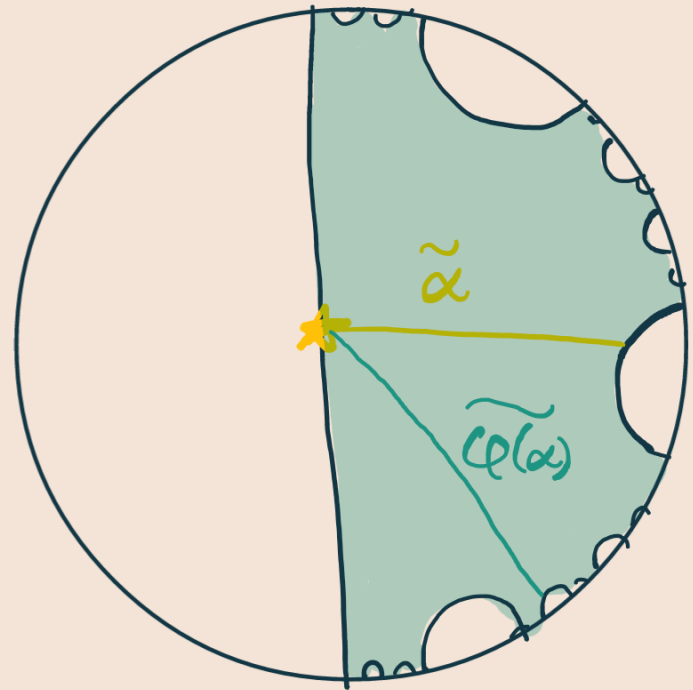
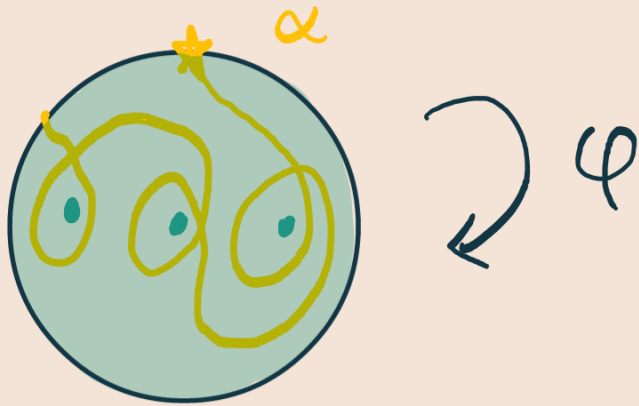
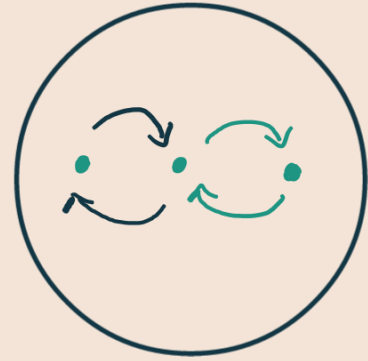
A **left-order**  $<$  on a group is an order with

$$f < g \Rightarrow hf < hg$$

**eg.**  $\mathbb{Z}^+$

**non eg.**  $\mathbb{Z}/2$        $0 < 1 \Rightarrow 1 < 2 = 0$

**Q:** which 3-mfds have  $\pi_1(M)$  left-orderable?



ASK: Is  $\widetilde{\varphi(\alpha)}$  to the "left" or "right" of  $\widetilde{\alpha}$ ?

⇒ right-veeringness

⇒ left-orders on mapping class groups

⇒  $\hookrightarrow \text{Homeo}^+(\mathbb{R})$



⇒ translation number  $\sim$  fractional Dehn twist coefficient

knots/links

contact structures

open book decompositions

foliations