

## Lecture 6 Lie group

We have seen some elements in Lie group so far.

- Definition & examples

$$GL(n; \mathbb{R}) \text{ or } GL(n; \mathbb{C}), SL(n, \mathbb{R}), O(n), Sp(2n), S^3, \mathbb{R}^n, \mathbb{T}^n, \dots$$

- Lie group homomorphism  $\varphi: F \rightarrow G$

Global constant rank ( $\Rightarrow$  group isomorphism is a diffeo)

- Lie subgroup (as an embedded submfld)

$$O(n) \hookrightarrow GL(n, \mathbb{R}) \quad \text{or} \quad S^3 \hookrightarrow \mathbb{R}^4(\text{so})$$

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To be explored:

$G$  + vector field, differential form, integration