

Compact Lie groups

Every compact Lie group has a **faithful** finite dimensional **unitary** representation.

So every compact Lie group G is a **closed subgroup** of $U(n)$ for some $n \gg 1$.

Lie algebra

Lie algebra of a compact Lie group is **reductive**.

Classification of compact Lie groups

[1]

The isomorphism classes of

- **simply connected compact** semi-simple \mathbb{R} -Lie groups G
- compact semi-simple Lie \mathbb{R} -algebra $\text{Lie}(G)$
- semi-simple Lie \mathbb{C} -algebras $\text{Lie}(G) \otimes \mathbb{C}$
- reduced abstract root systems

are in one-to-one correspondence.

1. <https://mathoverflow.net/a/25240/562926> ↩