

**Doctorate Course 2021. Group Theory**

*Sketch of the program*

1. Basic notions
2. Representations of the symmetric group
3. Lie groups and Lie algebras
4. The irreducible representations of  $GL(n, \mathbb{C})$ 
  - 1.1 Tensor representations
  - 1.2 Symmetry classes of tensors
  - 1.3 Unimodular groups
  - 1.4 Weights and weight vectors in  $SL(n, \mathbb{C})$
  - 1.5 Weights in the Lie algebra
5.  $SU(2)$
6.  $SU(3)$

*Basic Bibliography*

1. R. D'Auria. *Notes on group theory*
2. S. Sternberg. *Group theory and physics*. Cambridge University Press.
3. W. K. Tung. *Group theory in physics*. World Scientific
4. R. Gilmore. *Lie groups, Lie algebras and some of their applications*. John Wiley & Sons.
5. V. S. Varadarajan. *Lie groups, Lie Algebras, and their representations*. Springer.
6. W. Fulton, J. Harris. *Representation theory*. Springer.