



UNIVERSITÀ
degli STUDI
di CATANIA

DIPARTIMENTO DI FISICA E ASTRONOMIA
Ettore MAJORANA

DOTTORATO DI RICERCA IN FISICA

ANNO ACCADEMICO 2018 - 2019

Basics of Neutrino Physics

3 CFU

Teaching staff

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Reception hours: Monday-Thursday 12-13

Program of the course:

- 1) *Phenomenology of the beta decay. Leptons and neutrinos. No parity conservation in the beta decay. Experiment of Wu and collaborators. The experimental discovery of neutrino: Cowan-Reines experiment. Neutrinos and antineutrinos.*
- 2) *The bosons W and Z. Electroweak unification. Weak isospin. Weinberg angle.*
- 3) *The lepton families. PMNS matrix and leptonic flavor mixing.*
- 4) *Neutrino mass. Neutrino as Dirac or Majorana particle? Normal or inverted hierarchy mass?*
- 5) *Ongoing experiments with solar, atmospheric, reactor and accelerator neutrinos. Neutrino oscillations. Tritium beta decay. Neutrinoless double beta decay ?*

Bibliography:

- [1] C. Giunti and C.W. Kim: Fundamentals of Neutrino Physics and Astrophysics at Oxford University Press.
- [2] Course notes.