



UNIVERSITÀ
degli STUDI
di CATANIA

DIPARTIMENTO DI FISICA E ASTRONOMIA

DOTTORATO DI RICERCA IN FISICA

ANNO ACCADEMICO 2017 - 2018

Introduction to Neutrino Physics

2 CFU

Teaching staff

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Reception hours:

Program of the course:

Beta Decay and Neutrino Physics.

- 1) Phenomenology of beta decay. Leptons and neutrinos. Invariances and symmetries. No parity conservation in beta decay. Experiment of Wu and collaborators. Cowan-Reines Experiment. Neutrinos and antineutrinos. Mass of the neutrino. Neutrino as Dirac or Majorana particle ?
- 2) The lepton families. The bosons W and Z. Neutrino scattering. Deep inelastic neutrino scattering. PMNS matrix and leptonic flavor mixing.
- 3) Real bosons Z and W. Electroweak unification. Weak isospin. Weinberg angle.
- 4) Current issues: a) neutrino oscillations; b) double beta decay.

Bibliography:

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