The nature of neutrino

Abstract: (Pin-Ju Tien, seminar presentation at StonyBoork univeristy)

At 1930, Dirac introduce neutrino at beta decay to explain the momentum and energy conservation. At that time, neutrino does not have mass. But, now, we have known the mass of neutrino is very light. In this presentation, I would discuss the dirac and majorana neutrino and give a brief introduction about them. See-saw model is a good way to explain why neutrino is so light.

Moreover, my talk also included the neutrino oscillation. This neutrino oscillation is due to non-zero neutrino mass and non-equal neutrino mass. With help of Quantum mechanism, we can derive the neutirno oscillaiton at vacuum. But, I will not give the topic about the neutrino oscillation at matter. Finally, I will talk about double beta decay. With majorana neutrino, we can explain why double beta decay can occur. In this presentation, I focus on neutirno theory.

Ref:
[1] Neutrinos in Physics and Astrophysics by Chung Wook Kim and Aihud Pevsner
[2] Physics of Neutrinos and Applications to Astrophysics by M. Fukugita and T. Yangaida
[3] Quantum Field Theory by Sridniki