

- 2. Sterile neutrinos

Study how the existence of light nearly-sterile neutrinos affect neutrino oscillations and confront it with experiments

- i) Extend the 3-neutrino standard mixing scheme to include sterile neutrinos. Count the physical parameters.
- ii) Derive the neutrino oscillation probabilities in presence of sterile neutrinos in the experimentally relevant situations.
- iii) Confront these results with the experimental situation, identifying the origin of the tension between the hints in SBL experiments and the existing constraints on the parameters
- iv) Consider the SBN setup at Fermilab and understand their sensitivity to the sterile neutrino hypothesis.

*Possible future directions: sterile neutrinos in the EU*