

TF11 (née NF08) – Theory of Neutrino Physics

- André de Gouvêa
- Irina Mocioiu
- Saori Pastore
- Louis Strigari

Summary:

- 52 LOIs associated to TF11 [\leftarrow need all of these (large overlaps with NFxx)];
- Self-identified primary Topical Group in 3 LOIs;
- Around 20 LOIs “assigned” TF11 as primary.

Self-identified primary Topical Group in 3 LOIs

1. TF053 - Bridging particle and nuclear physics for neutrinoless double beta decay with EFTs
2. TF090 - Microscopic approaches to neutrino-nucleus interactions
3. TF085 - Deciphering explosion physics from the supernova neutrino signal

[→NF04]

- **Theory and Phenomenology of Neutrinos**

- What is the origin of nonzero neutrino masses?
 - * EF099 - Scrutinising Left Right Symmetric Extensions at LHC and Beyond
 - * NF045 - THREE STERILE NEUTRINOS IN E_6
 - * NF195 - Neutrino Minimal Standard Model a unified theory of microscopic and cosmic scales
 - * NF019 - Testing quasi-Dirac leptogenesis through neutrino oscillations
 - * NF024 - LNV Meson Decays and Displaced Decay Searches to Probe Heavy Neutral Leptons in Leptoquark Assisted Seesaw Model
 - * NF114 - Testable neutrino mass models
 - * RF118 - Neutrino mass models at colliders in a post-ESU era
 - * TF023 - Low Mass Right Handed Neutrino at LHC and HL-LHC
- Is there a theory of flavor?
 - * NF025 - Leptonic Sum Rules
- neutrino puzzles, including the short-baseline anomalies;
 - * NF131 - Neutrino Decay as a Solution to the Short-Baseline Anomalies

- **Theory and Phenomenology for Neutrinos**

- New neutrino properties and not-neutrino experiments;
 - * RF055 - The quest for explaining the top-row CKM unitarity deficit
- neutrino-nucleon and neutrino-nucleus scattering;
 - * CompF039/040- Lattice Calculation of Neutrino-Nucleon Cross Section
 - * TF090 - Microscopic approaches to neutrino-nucleus interactions
- matrix elements for neutrinoless double-beta decays;
 - * TF053 - Bridging particle and nuclear physics for neutrinoless double beta decay with EFTs
 - * CompF017 - Numerical Lattice Gauge Theory
- Neutrino phenomenology for neutrino experiments;
 - * NF036 - NSI from a flavorful Z' model
 - * NF023 - Neutrino Non-Standard Interactions
 - * NF110 - A comprehensive EFT global fit in the neutrino oscillation experiments
- Not-neutrino phenomenology for neutrino experiments;
 - * CF267 - Indirect Detection Aspects of Hidden Sector Dark Matter

CPM and Pre-CPM Activities

- Mini-Workshop in Neutrino Theory (September 21–23, 2020)
<https://indico.fnal.gov/event/45039/overview>
- We have agreed to help organize a couple of parallel sessions at the CPM:
 - Theory Applications in Neutrino Physics;
 - Learning the Origin and Nature of Neutrinos.