Physics cases
(GP Mangano and GL Cavoto)

1) DM (A Polosa & M Lisanti)

2) Neutrino mass, CNB, clustering (GP Mangano, S Gariazzo, P Fernandez and S Pastor)

3) 3H decay theory e decay con 3H polarizzato (L Marcucci)

Draft of the section ready by middle March and finalized by the end of the month

High Radiopure C
(F Zhao)

1. Procurement of high purity CO_2
2. Development of methods to transform CO_2 in CH_4
3. New method for traces measurement of ^{14}C at level of 10^{-21} for $^{14}C/^{12}C$

Graphene studies for Tritium and Dark Matter
(J C Loper and C mariani)

1. Characterization of high quality graphene samples from GRAPHENEA by using available equipment in the laboratories involved.
2. Measurements of the transmission coefficients of the wave function of an electron
3. impinging on a graphene-monolayer.
   - E beam of high energy (< 20 keV).
   - beam detector
   - integration with existing instrumentation and setup optimization in order to measure the
   - e beam as function of energy and incidence angle.
4. Realization and characterization of a graphene Nano-ribbon. Do we have any company capable of providing any sample?
5. Study of the electron propagation in a graphene nanotubes.

High stability Voltage and Calibration methods (M Messina)

1. Finalize the HV generation and measurement based on locking capacitor and Field Mill
   a) Investigate and mitigate the source of noise and its contribution to the width of the measurement.
   b) Investigate and mitigate as much as possible the long time decay rate
   c) Test the setup in N atmosphere and in vacuum: is Rn playing a role on the stability of the HV? Cosmic rays contributes to HV decay.
   d) HV reset as follow from the point b) with solid state devices or switching power supply?
2. Test of performances when the HV is connected to the vacuum chamber and electrode by means of HV feedthrough.
3. Finalize the simulation of the E-beam with COMSOL
4. Setup test in vacuum of the E-gun with components fully built: electrodes, pillars, ground screen, UV source (under delivery), focusing lens and its support.
5. Characterize the width of the energy distribution and detection capability of the beam.

Cryogenics

1. What are the facilities available at LNGS?

2. Accessibility to the He compressor facility
   - How complicate is to build a recuperation pipe?
   - Is it possible to have an agreement with the groups that owns the facility?

3. Is there any possibility to loan a dilution refrigerator from LNGS groups?

TES calorimeter
(F Gatti and E Monticon/ M Rajteri)

1. Production of high performance TES 10x10 μm
2. Characterization with 1 eV photons
3. Building setup capable to drive single electron in the TES
    - Design and construct an electron source: quartz fiber coated with gold?
    - Design and construct a focusing system suitable for the TORINO setup (12x12x12 cm^3)
4. First electron measurement with the best achievable energy resolution.
5. Production and characterization, with IR light at least, of TES sensors for the PTOLEMY prototype.

Modeling and Simulation

1. Software tools available @ LNGS (COMSOL, Kassiopeia, ROOT)

2. Design of a new highly scalable E•B filter:
   - Tritiated graphene electron injection into drift region
   - accomplish RF tagging and event rejection
   - focusing into TES active region
   - systematic effects on electron energy

3. Electron source modeling (single electron):
   - small size very high precision for TES measurements (1÷200 eV range ?)
   - prototype testing (under construction) (1÷20 keV range)
   - graphene studies (small size ? tunable emission angle? Range TBD)

Prototype tests
(M Messina)

1. Underground area refurbishment
2. Shipment:
    - Vacuum chamber
    - Central electrodes
    - Standard HV power supply
    - Vacuum station
3. Vacuum test
4. HV test