

**Title: From LARIAT to protoDUNE: digging into LArTPC technology for the future short and long-baseline neutrino experiments.**

**Speaker: Flávio Cavanna (L'Aquila University)**

**Abstract:**

The seminar will review the experimental technique of the liquid argon time projection chambers (LArTPC), which is one of the most popular in the actual particle physics scenario. In particular it is the technique chosen by DUNE (Deep Underground Neutrino Experiment) to address some of the open questions in neutrino physics, namely the measurement of the CP violations phase in the leptonic sector, the hierarchy of neutrino masses and the  $\Theta_{23}$  octant. The DUNE LArTPC will have an active mass of 40 kton of LAr and will be the largest detector of this type ever built. LArIAT (Liquid Argon In A Test-beam) and protoDUNE represent two important and distinct phases of the R&D towards the realization of such a huge detector. The first is a small TPC (170l) of LAr that is already operating at Fermilab and is intended to deeply investigate the physics of the interaction of particles with LAr. The second will serve as a large scale (400 ton) prototype, aimed to test technical and technological solutions that will be implemented in DUNE, and will be realized at CERN in the next 2/3 years.

#### **About prof. Flávio Cavanna**

Professor at L'Aquila University and visiting scientist at Fermi National Accelerator Laboratory. He is one of the World wide recognized experts of liquid argon technology. He is actually spokesperson of the LArIAT and protoDUNE experiments, which represent two milestones toward the realization of the DUNE experiment.