

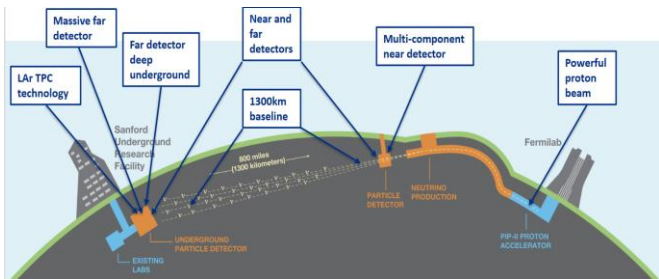


DUNE PDS

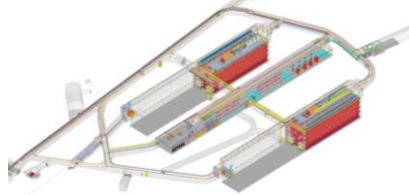
Séminaire projets APC

Sylvie Blin : Responsable technique
Bernard Courty, Jaime Dawson, Pierre Prat, Sabrina Sacerdoti,
Henrique Vieira de Souza

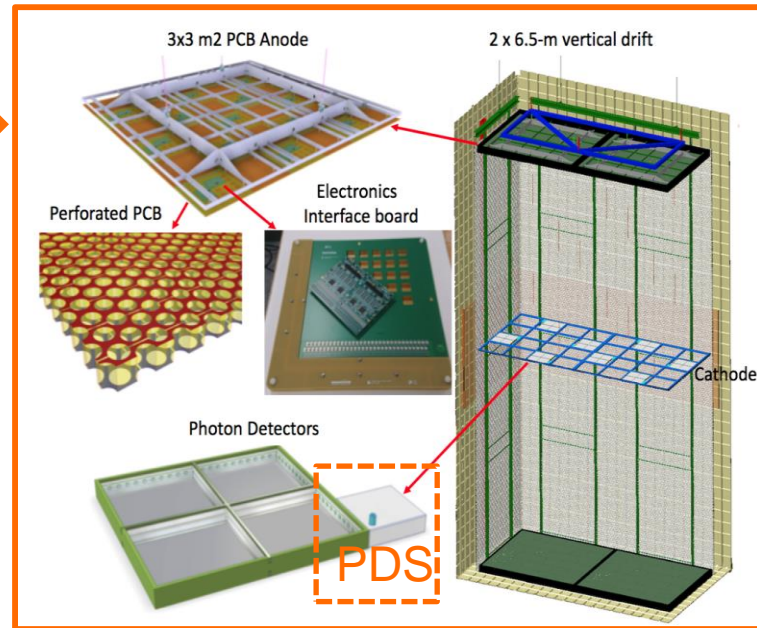
DUNE experiment



The Far Detector



LAr Vertical Drift TPC



an **'international project'** with contributions from APC, IJCLab, IP2I Lyon, LAPP, LPSC, LP2I Bordeaux.

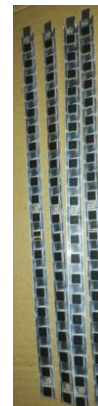
- Argon TPCs – the next-generation neutrino detector Argon
- To discover new neutrino properties by studying neutrino oscillations, proton decay and supernova neutrinos

- Photon detectors based on X-ARAPUCA technology
 - integrated on cathode plane and on the cryostat behind the field cage
 - electrically floating Photo-sensors and r/o Electronics : Power (IN) and Signal (OUT) transmitted via non-conductive cables (e.g. optical Fibers)
- SOF: Signal Over Fiber
 - Conversion electrical signal to optical signal
 - Requirements:
 - Electrical components working in Liquid Argon environment
 - Low Power consumption
 - Bandwidth: 20 MHz
 - SNR > 4
 - Dynamic range: 1pe - 1000 pes
- Optical receiver multi channel:
 - 4 or 8 channels
 - Interface with the acquisition board called DAPHNE

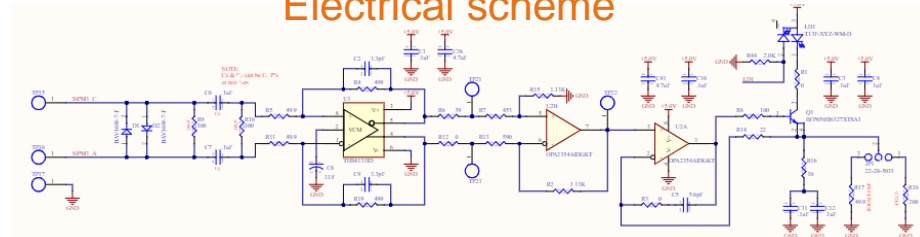
X-ARAPUCA



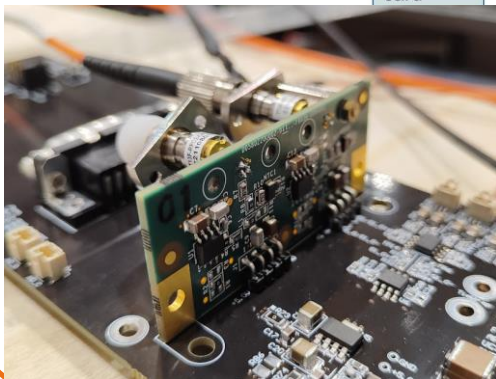
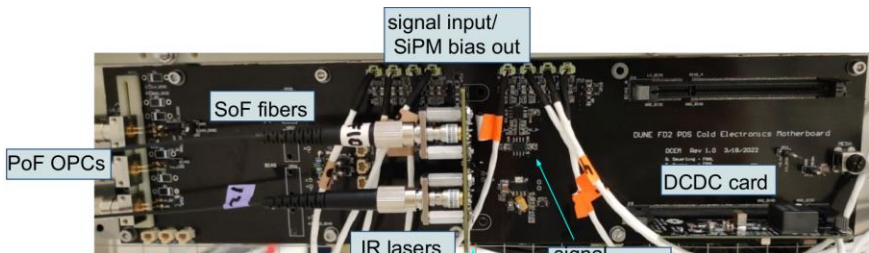
Flex SiPM



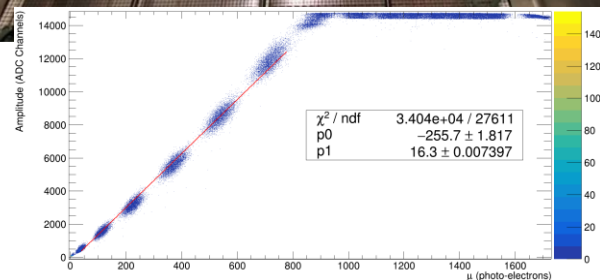
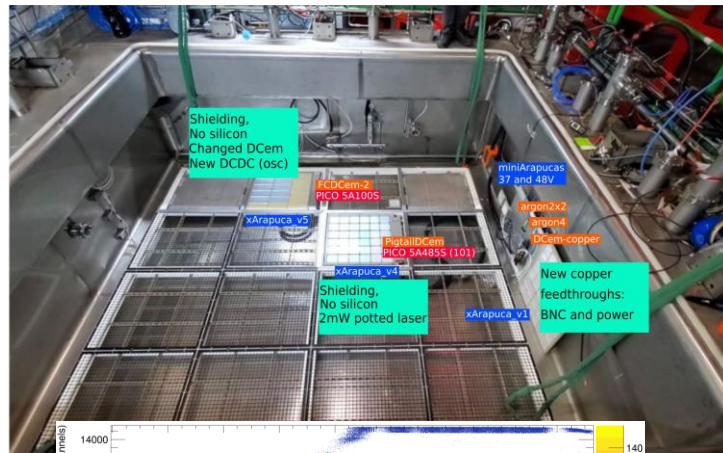
Electrical scheme



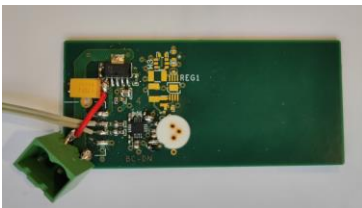
➤ Transmetteur optique



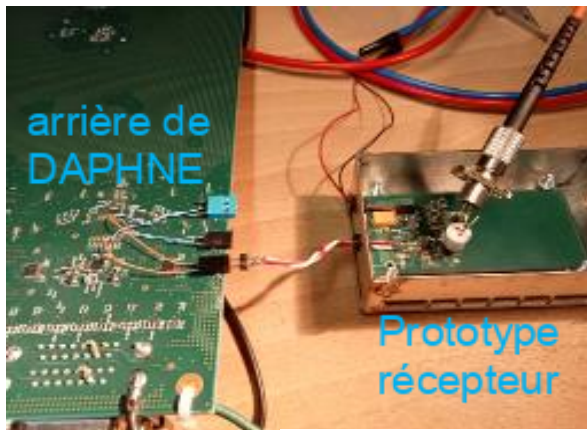
➤ CERN : Test cold box



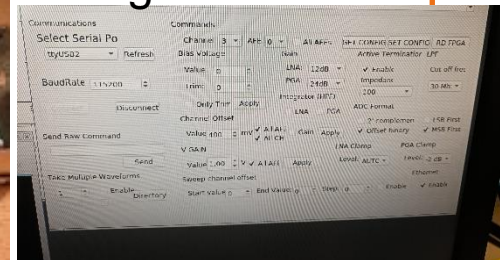
➤ Récepteur optique



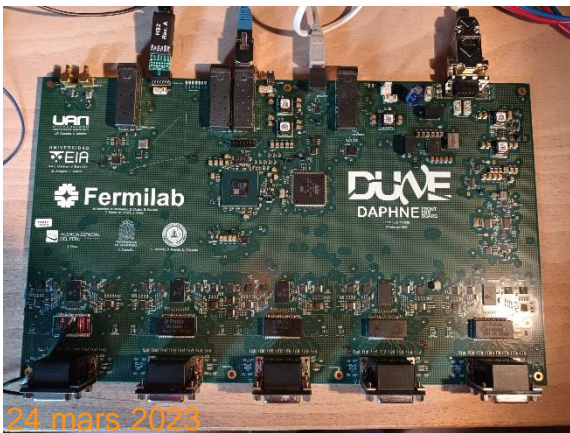
➤ Communication DAPHNE



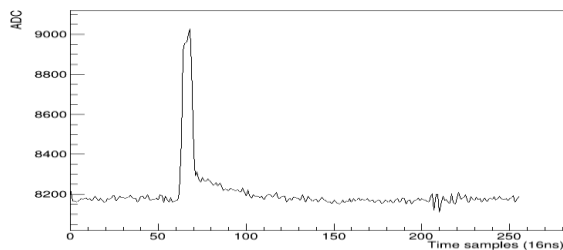
Configuration Software



➤ Carte DAPHNE top view



24 mars 2023



- Production: 640 channels + spares (2024-2025)
 - Laser adapter board: 320 boards + spares
 - Receiver: 40 boards + spares
- Planning:
 - April 2023 - Final Design Review (transmitter)
 - June: 8-channel receiver prototype
 - Jul-Aug: Demonstrate qualified solution (CERN cold box)
 - Mars 2024: Production Design Review

Laser adapter board

