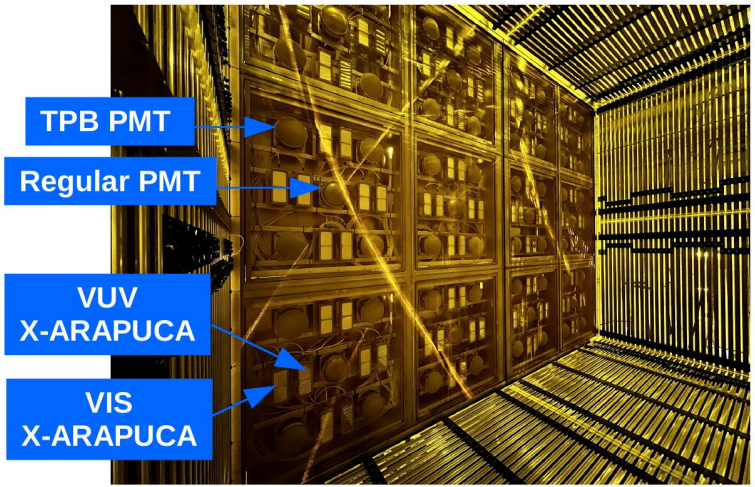
Funded by
the European Union

CIEMAT & U. of Granada secondments in 2022 – 2023

José I. Crespo-Anadón (CIEMAT)
on behalf of CIEMAT and U. of Granada groups

GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA E INNOVACIÓN
Ciemat
Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas
cfp CIEMAT física de partículas
UNIVERSIDAD DE GRANADA

SBND Photodetection system



Liquid argon is a scintillator. VUV photons are emitted when a charged particle excites the argon.

SBND has an advanced photon detection system mounted behind the wire planes:

120 8” Hamamatsu R5912 Cryogenic PMTs. 80% coated with TPB to detect VUV light. 20% uncoated.

- **U. of Granada** is leading the light propagation simulation and the PMT signal simulation and reconstruction. (WP2)

192 X-ARAPUCAs (light traps). 50% sensitive to VUV light and 50% sensitive to visible light.

- **CIEMAT** is leading the X-ARAPUCA signal simulation and reconstruction. (WP2)

Wavelength-shifting (TPB) reflector foils on the Cathode Plane Assembly to convert VUV photons into visible photons to improve response uniformity.

Secondments in 2022

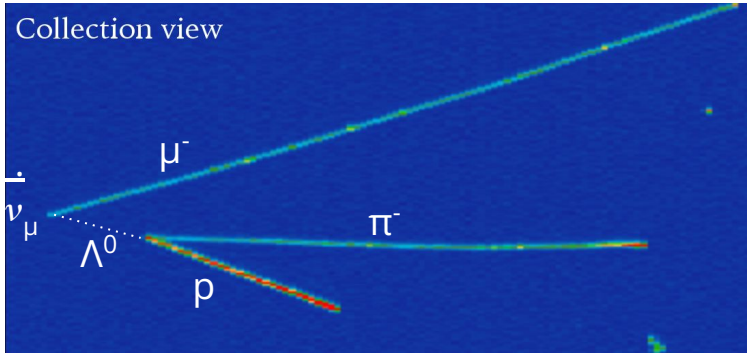
CIEMAT

- Rodrigo Álvarez and Inés Gil-Botella: 1-week visit to FNAL to attend the June 2022 SBND Collaboration Meeting to present results on optimization of photon-cluster (flash) reconstruction with X-ARAPUCAs (WP2).

Plans for 2023

U. of Granada

- Francisco Nicólas is visiting FNAL for 6 months (Jan – Jun):
  - PMT pre-fill commissioning (WP1)
  - PMT simulation performance analysis (WP2)
  - Neutrino-induced quasi-elastic hyperon production (WP3).
- Diego García and Patricia Sánchez are visiting FNAL for 2 months (summer):
  - Detector checkout and preparation for cold commissioning (WP1)



CIEMAT

- Rodrigo Álvarez is visiting FNAL for 3 months (spring):
  - X-ARAPUCA pre-fill commissioning (WP1)
  - X-ARAPUCA simulation performance analysis (WP2)
  - Heavy neutral lepton N → $e^+e^-\nu$ reconstruction (WP3)