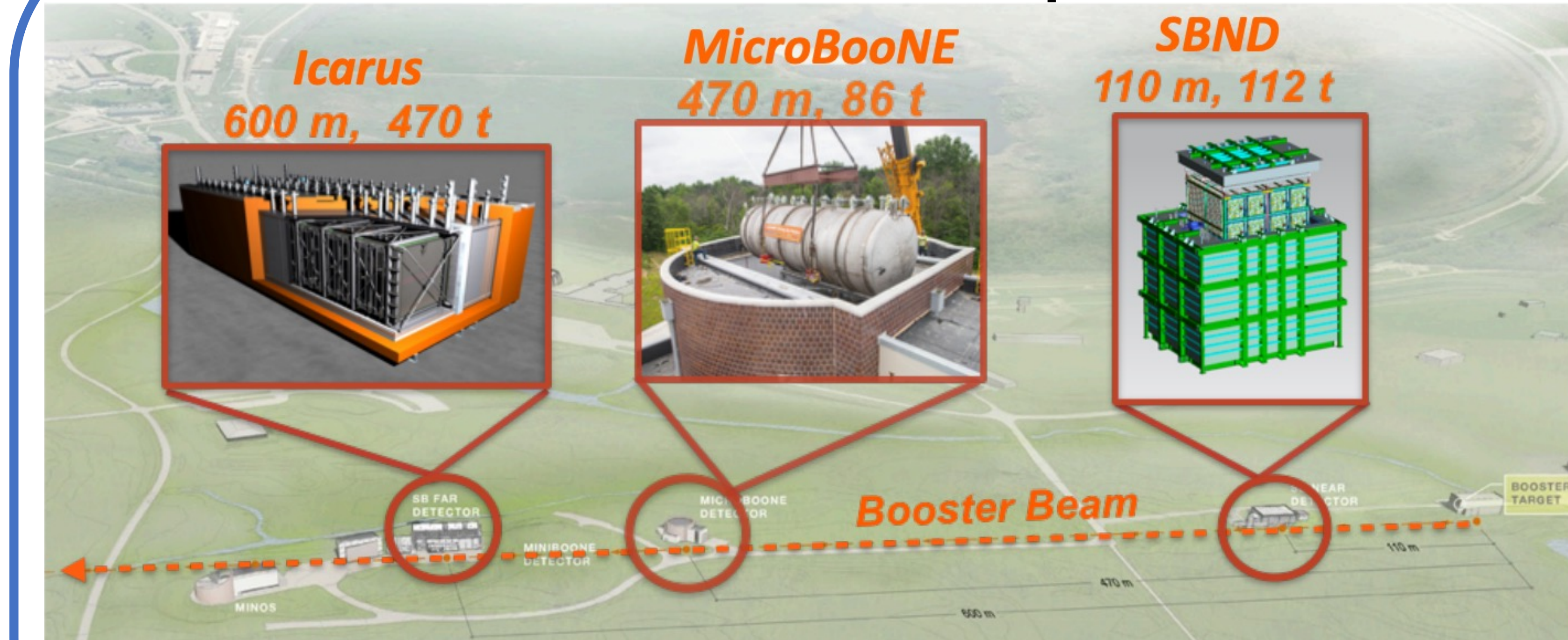
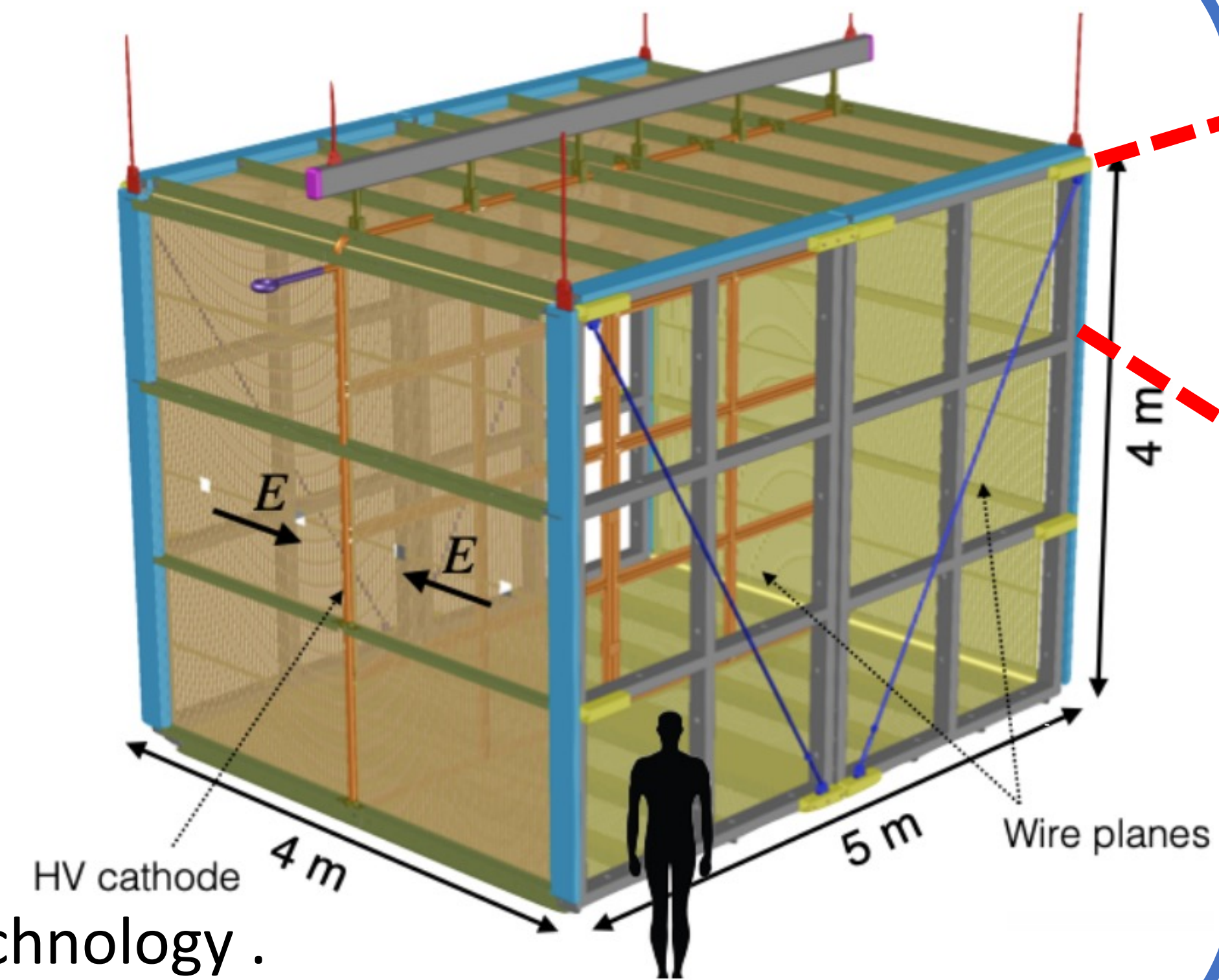


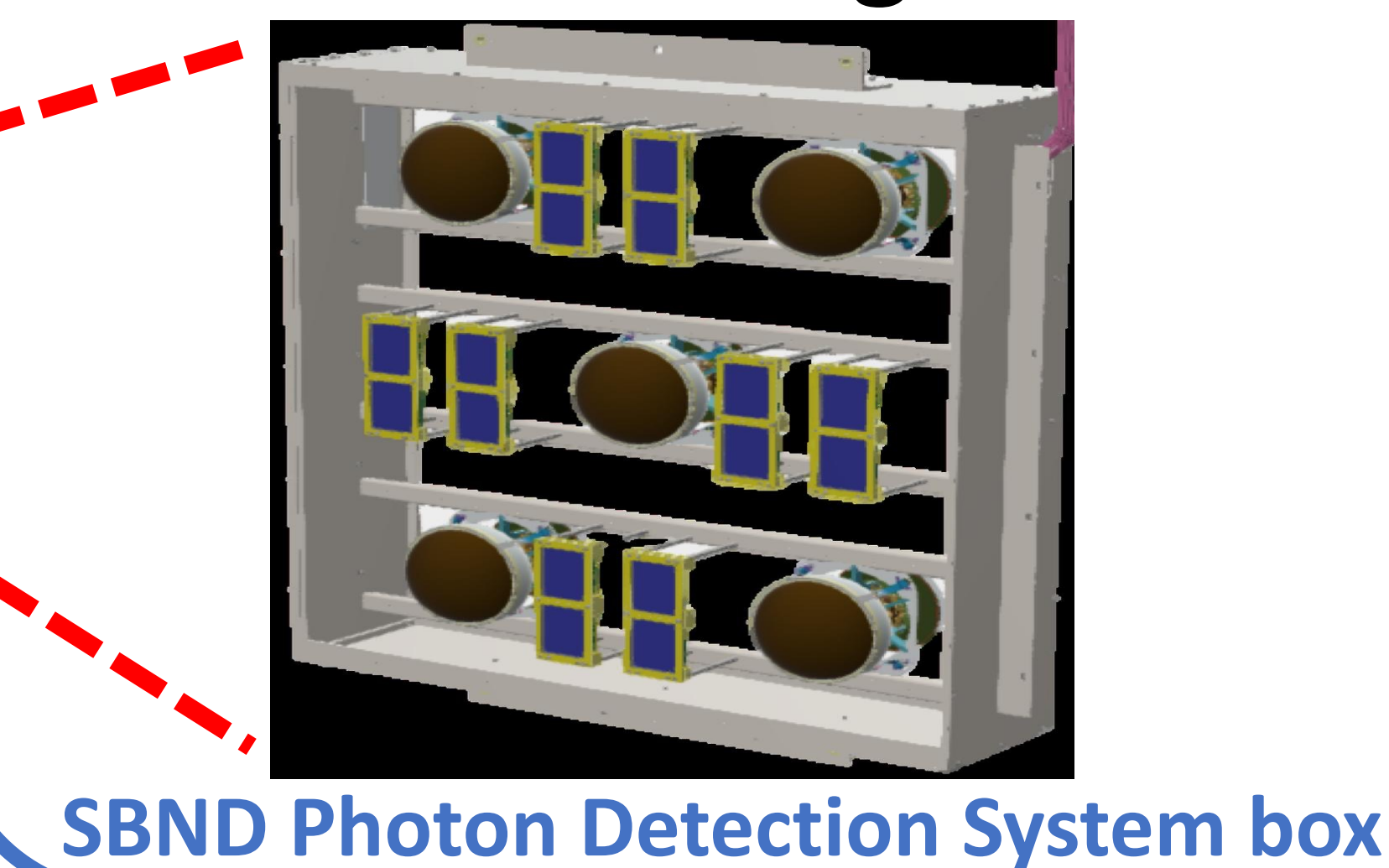
SBND Experiment Overview



- One of the 3 detectors in the SBN program at Fermilab, uses LArTPC technology.
- Consists of 2 TPCs having a drift distance of ~ 2 m, active mass is ~ 112 tons and E-field of 500 V/cm.



Light Detection System (LDS)

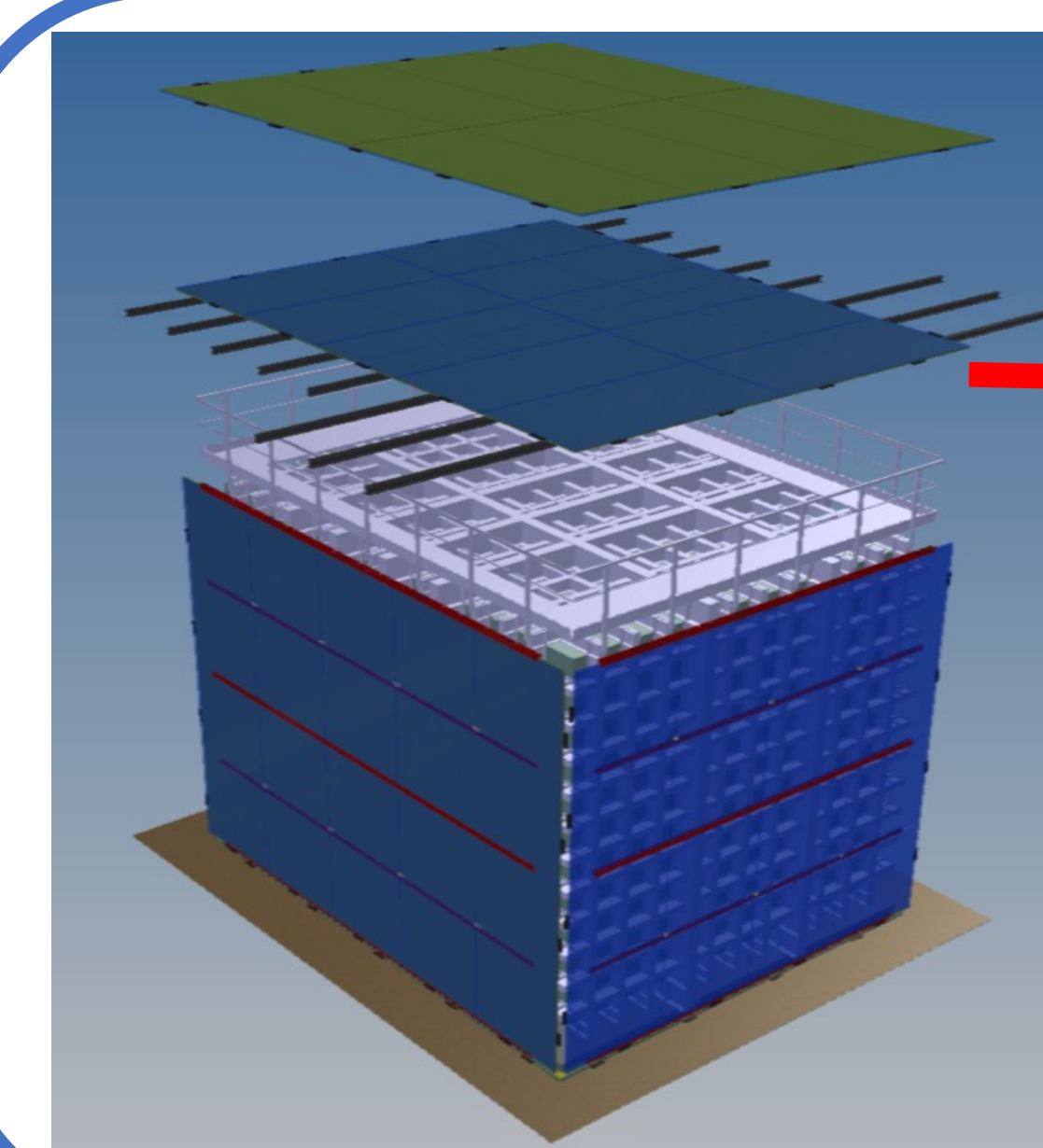


SBND Photon Detection System box

Mounting PMTs on PDS boxes

- LDS consists of,
 - 120 Photo Multiplier Tubes (PMT)
 - 192 Xarapucas
- All PMTs are tested and mounted on PDS boxes while production of Xarapucas ongoing.
- Capable of reconstructing particle interaction times at a few nano-seconds precision level.

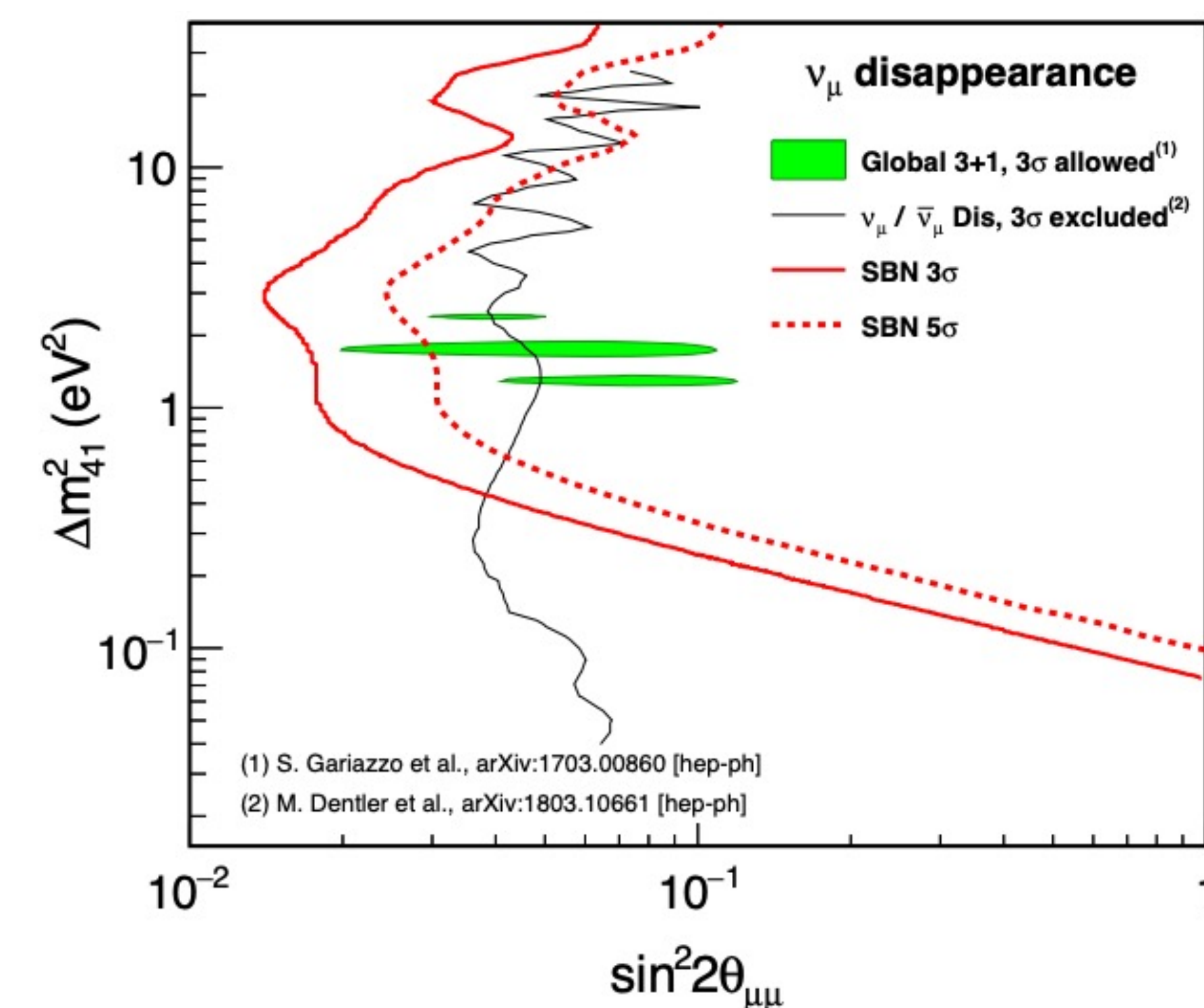
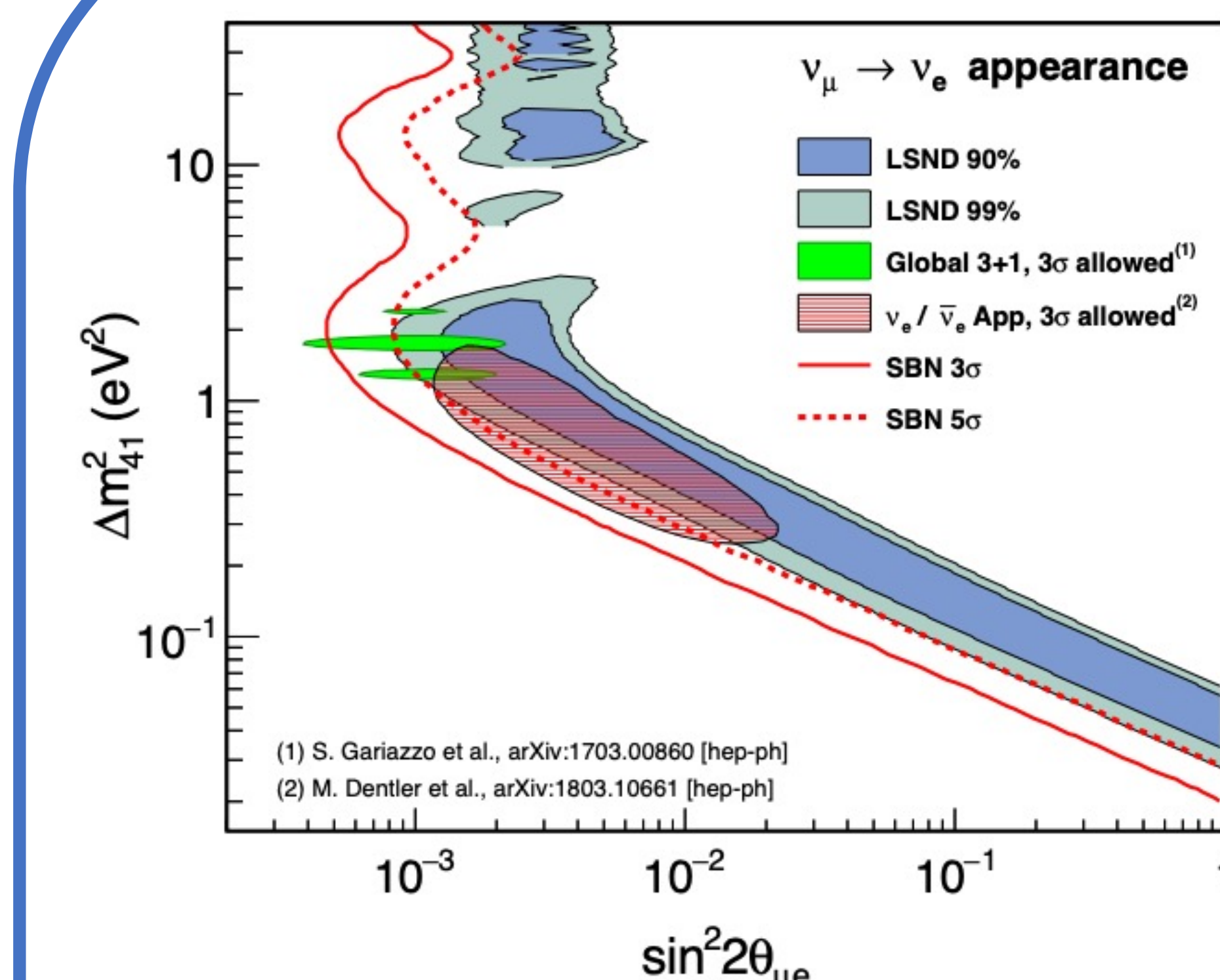
Cosmic Ray Tagger (CRT)



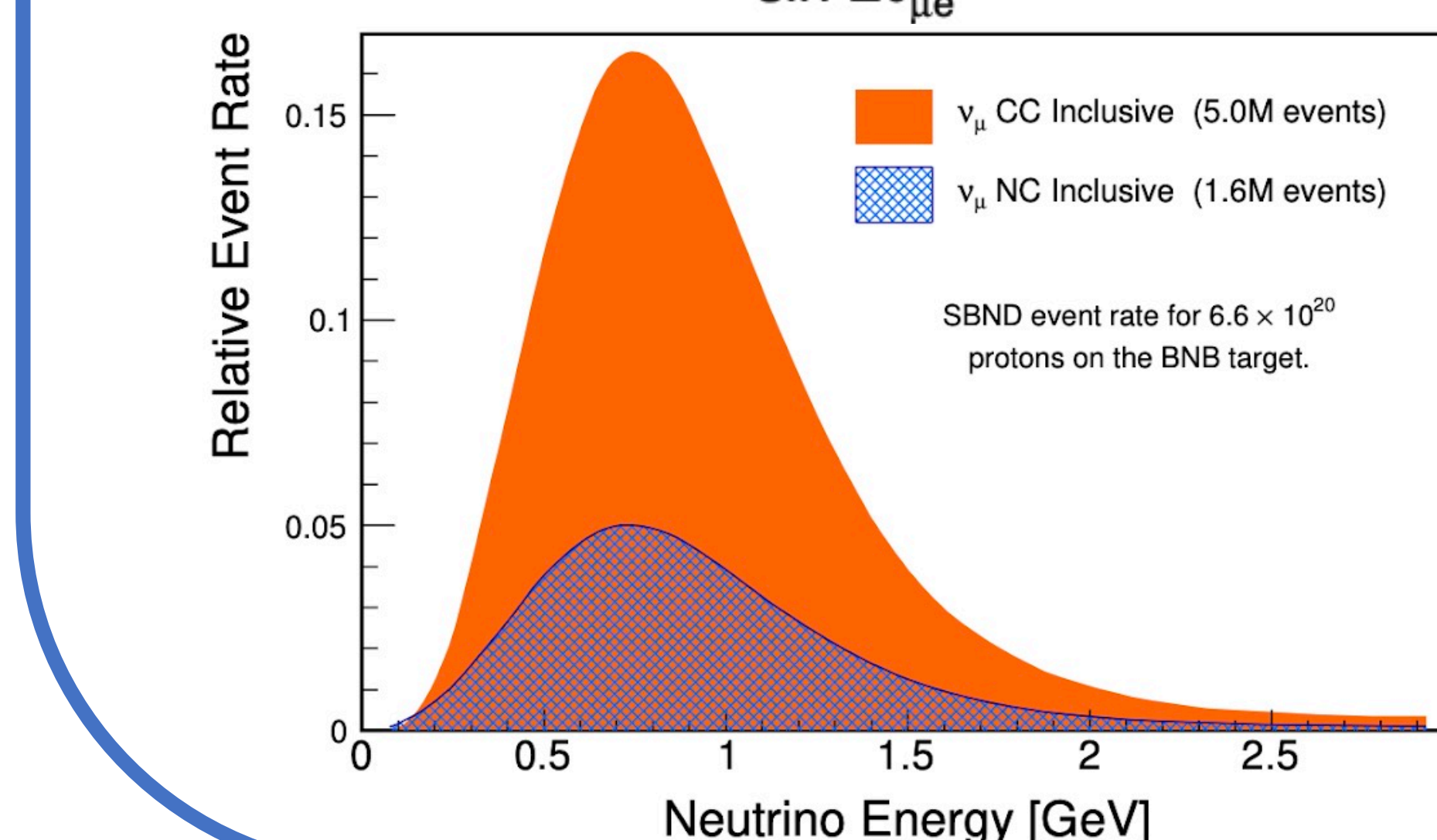
Scintillation strips

- CRT provides full 4π coverage to identify cosmics.
- Consists of 7 CRT panels each made up two perpendicular layers of scintillating strips.
- Production of all CRT panels are done and onsite.
- Capable of providing nano-seconds level timing and a few centimeter level coordinate resolutions.

SBND Physics



- SBN program will either confirm or rule out the hints for the existence of eV-mass sterile neutrinos observed by MiniBooNE/LSND experiments over 5 σ confidence level.



- Will collect ~ 7 millions of neutrino interactions both in CC and NC modes in 3 years of operations.
- Ideal venue to perform $\nu - Ar$ cross sections in different exclusive channels.
- Capable of looking into some BSM physics as well.
 - Neutrino tridents
 - Light dark matter
 - Milli-charged particles
 - Heavy neutral leptons

Assembly & Transport Facility (ATF) and Cryostat



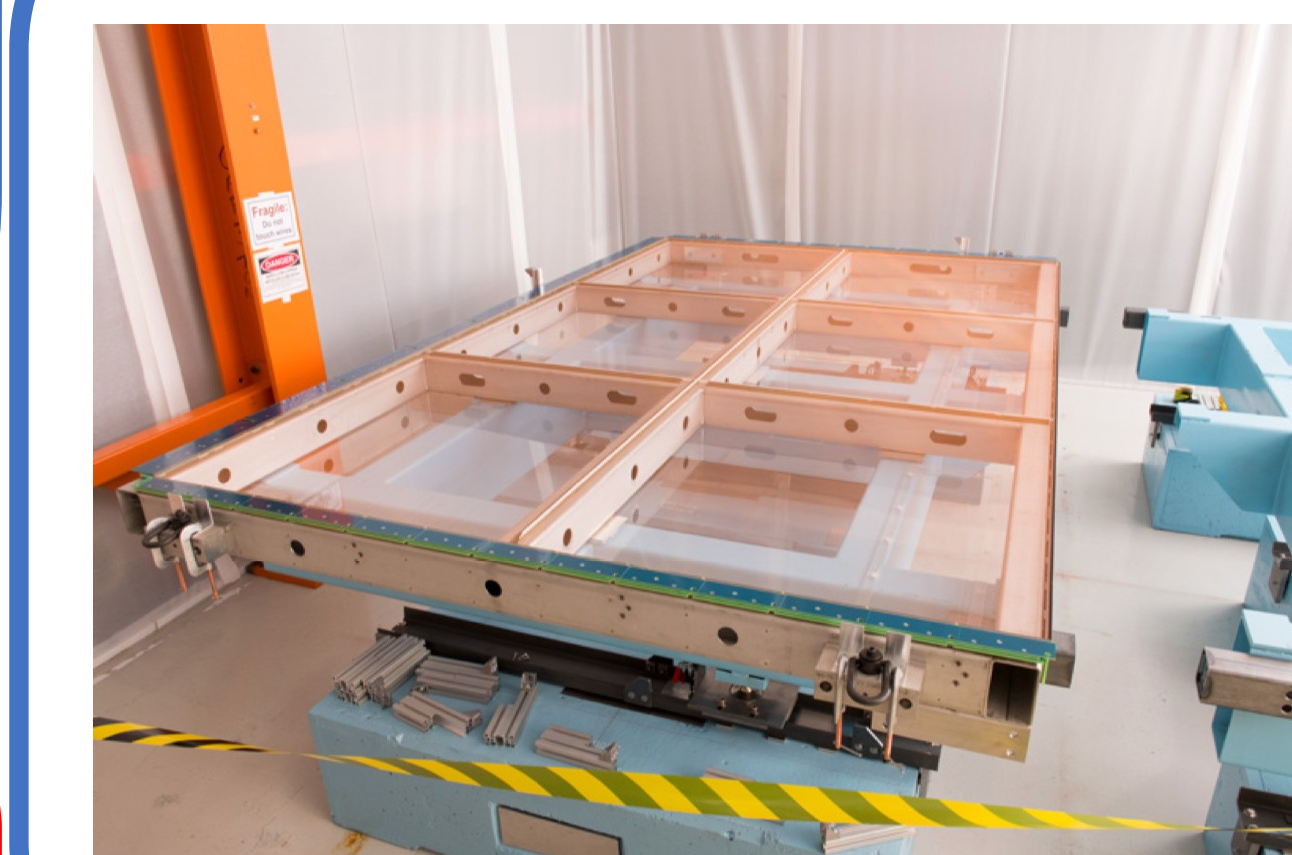
Warm outer vessel



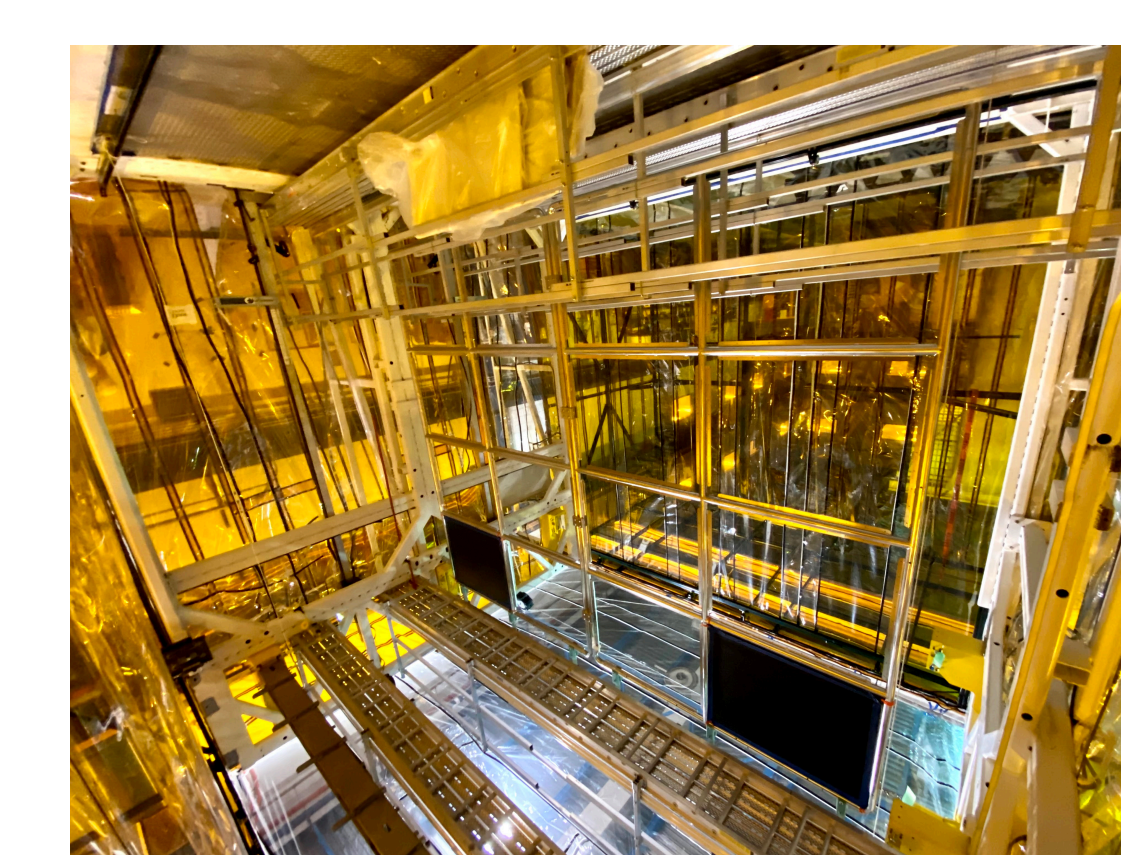
ATF clean tent

- ATF clean tent is complete and detector assembly in it has already started.
- Warm outer vessel of the cryostat has already been installed in near detector building while membrane installation of the cryostat is scheduled to happen soon.

Cathode plane & Anode planes



Anode plane module



Cathode plane frame

- One of the anode planes is fully assembled and will soon be installed in the ATF (the two modules of the remaining one yet to be mechanically & electrically coupled)
- Cathode frame has recently been attached to the ATF and installation of the mesh panels are underway.

Cold Electronics



Front end mother board

- All the cold electronics are tested and onsite while cold electronics cable tray installation is ongoing.

Summary

- Construction of the SBND detector has been steadily going forward, will be fully commissioned by early 2023.
- So many exciting ongoing physics analysis presented in number of conferences.
- Already produced a few publications.

Link to SBND publications and conference talks :
<https://sbn-nd.fnal.gov/documents.html>