

Status of SBND Construction

Anne Schukraft
ND All Hands Meeting
Oct 18, 2022



A year of detector construction at DAB

July 2021



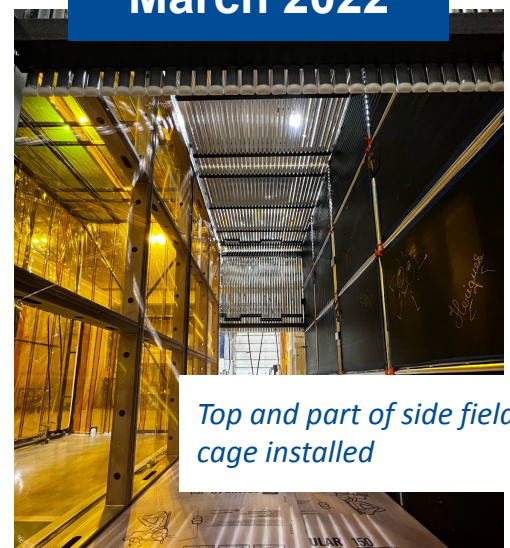
Cathode installed as first component in the assembly transport frame (atf)

December 2021



Both APAs installed

March 2022



Top and part of side field cage installed

June 2022



Field Cage closed. Cold Electronics installed.

September 2022

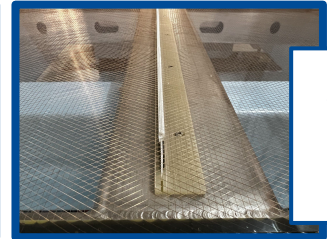


PDS System installed. Detector Complete.



SBND Detector

4m x 4m x 5m active volume
112 t LAr (active)
2m drift

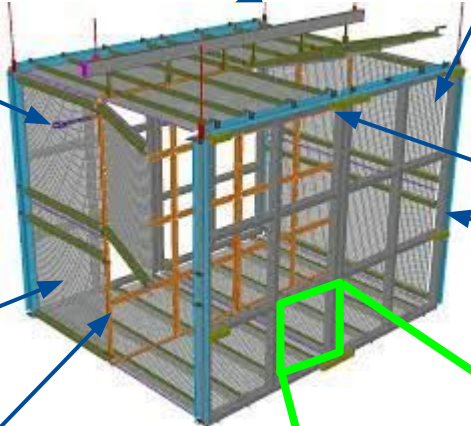


2 Anode Wire Planes

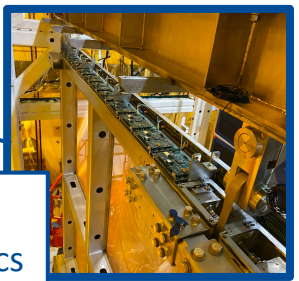
3 readout wire planes per anode
(2 induction, 1 collection); ~11000 wires
Cold amplification & digitization



High Voltage Feedthrough



16 Field Cage Panels

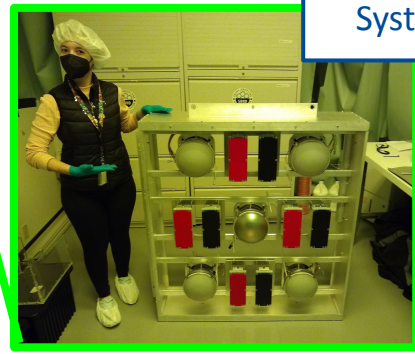


Cold Electronics

24 Photon Detection System Modules



16 TPB coated reflective panels



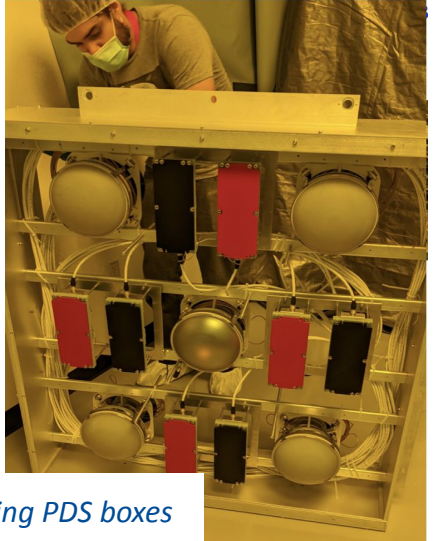
120 8" PMTs & 192 X-ARAPUCA modules



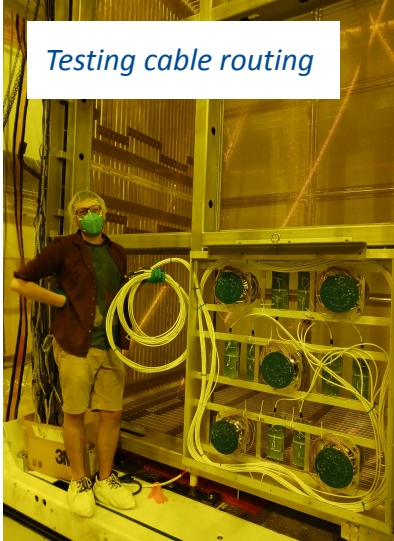
Cathode Frame

Installation of the light detection system

Summer 2022



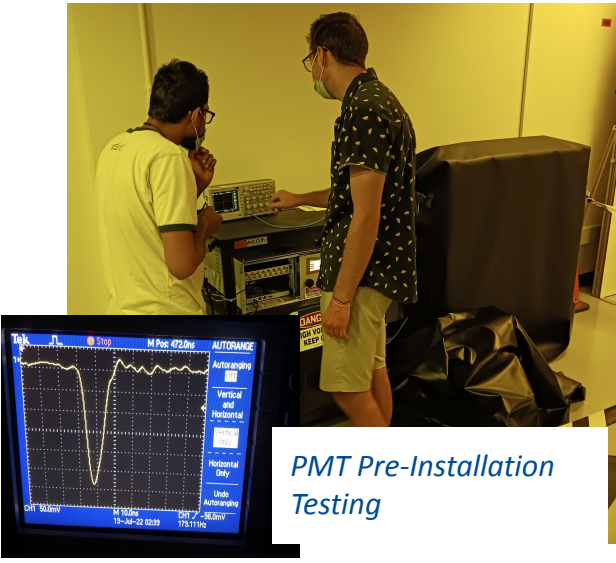
Assembling PDS boxes



Testing cable routing



Antonio soldering a lot of things for us...



PMT Pre-Installation Testing



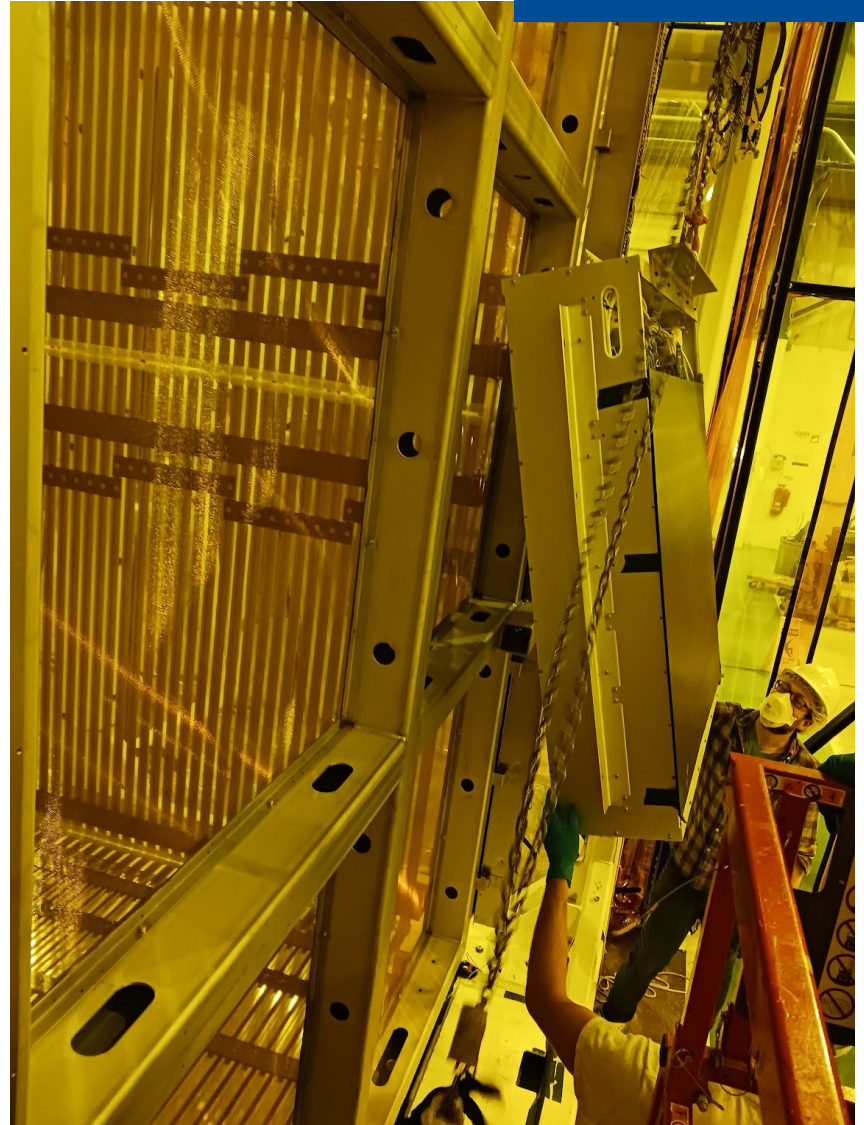
Cold testing of cables & connectors at PAB



Load testing the custom installation lifting fixture

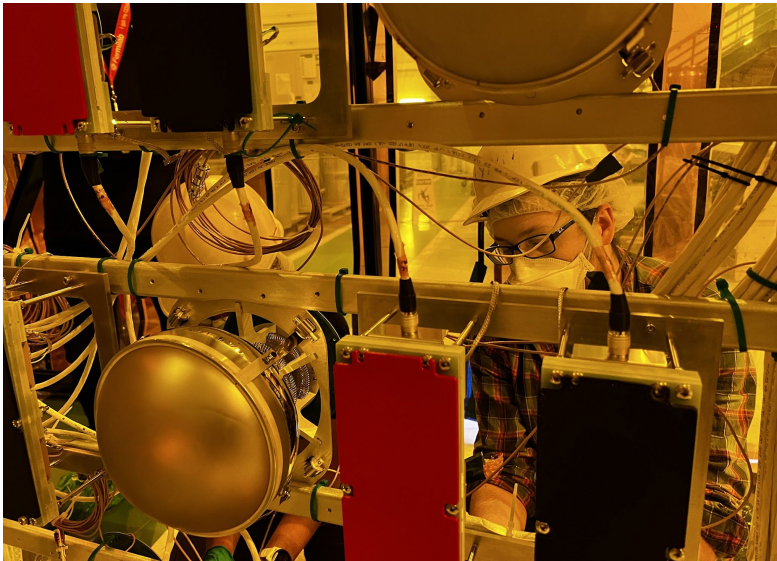
Installation of the light detection system

Summer 2022

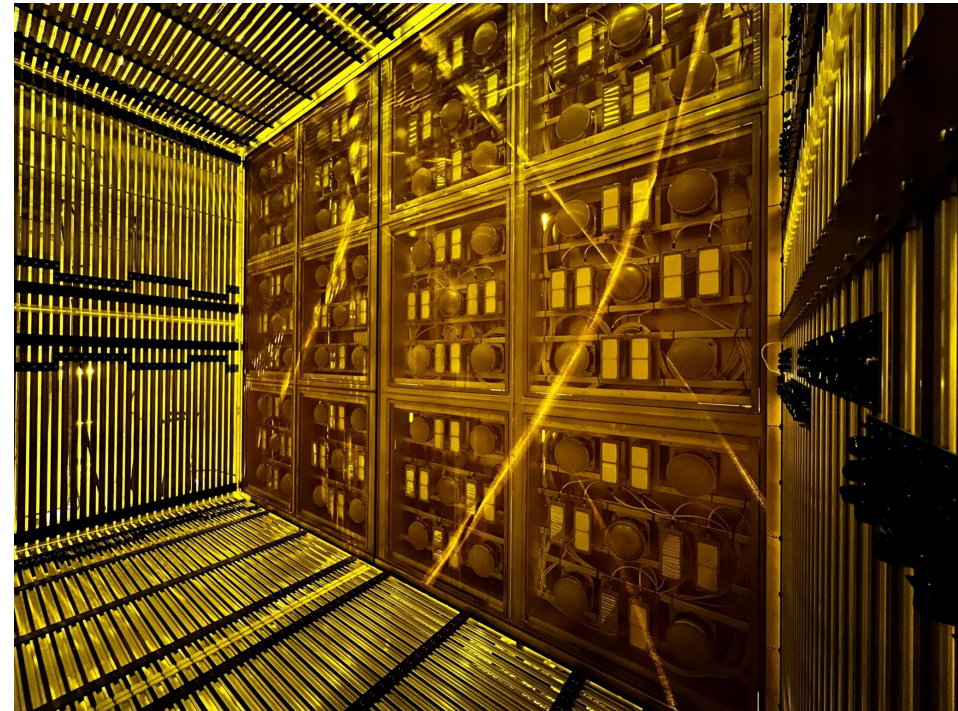


Installation of the light detection system

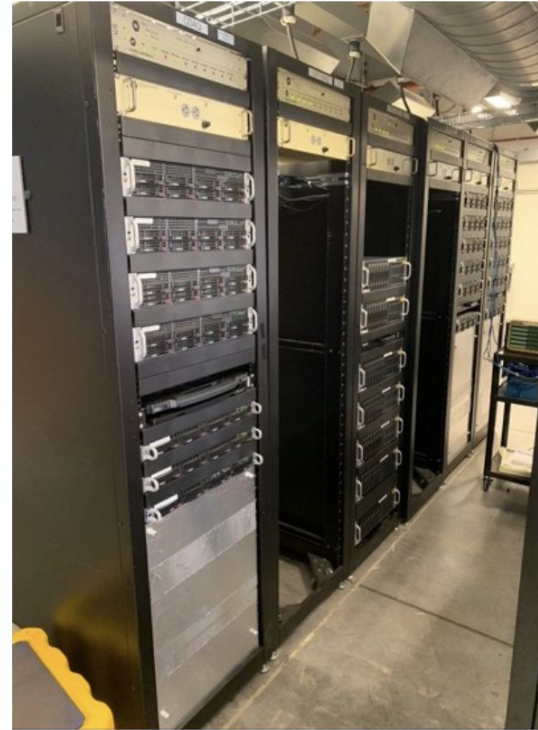
Summer 2022



And just because it's so beautiful...

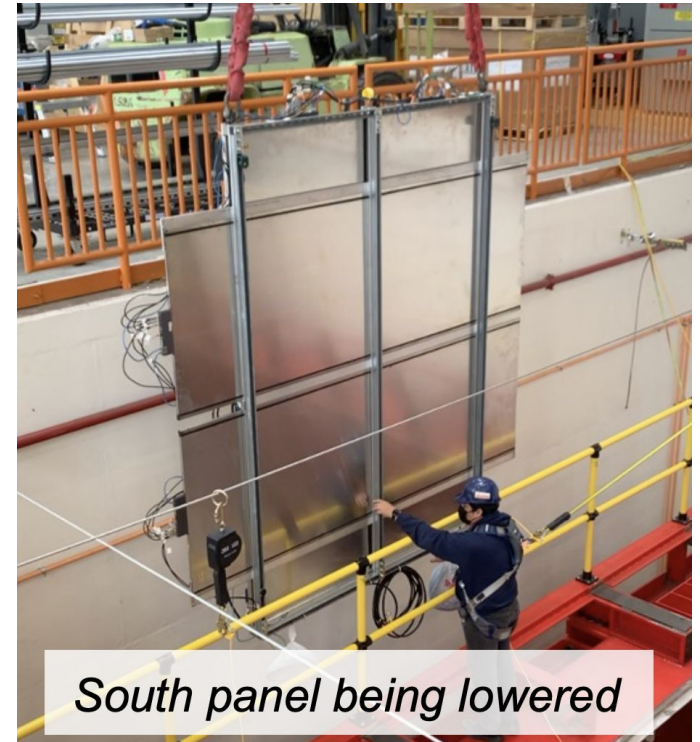


SBN Near Detector Hall - Electrical Installation and Pre-Commissioning



Now!

Readout Rack & Server Rack installation well underway. DAQ and Readout are up and running, and being used for DAQ testing & development



South panel being lowered

CRT Beam Telescope with 2x (2x2) panels on upstream and downstream of the cryostat. Practice for CRT installation and development of DAQ, triggering, timing,

Cryostat Installation: Secondary Insulation Panels & Secondary Membrane

May/June 2022



Insulation panels



Panels being craned down for installation



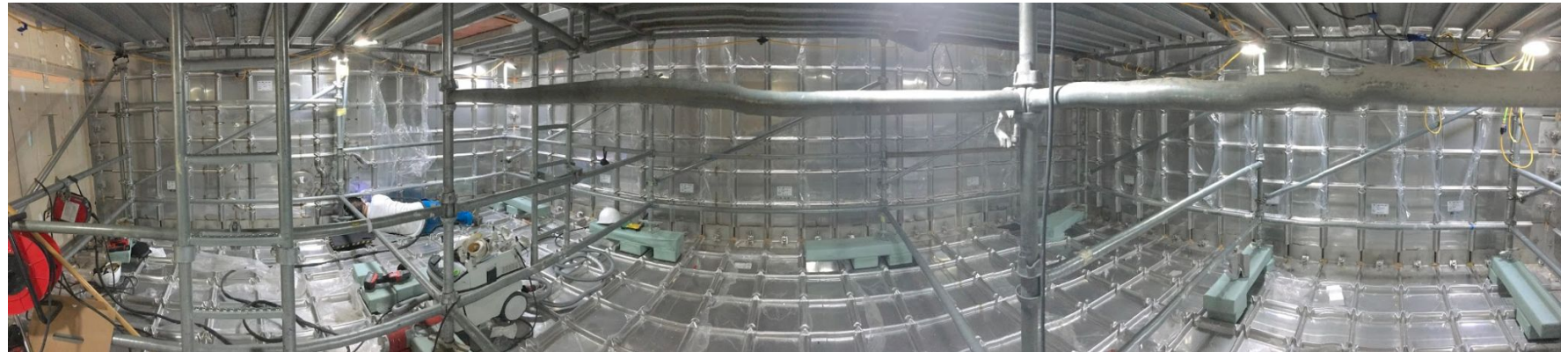
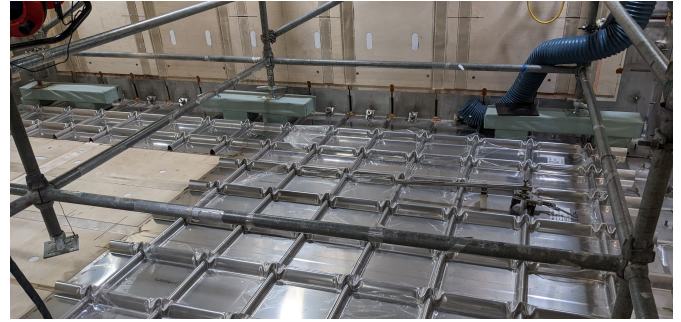
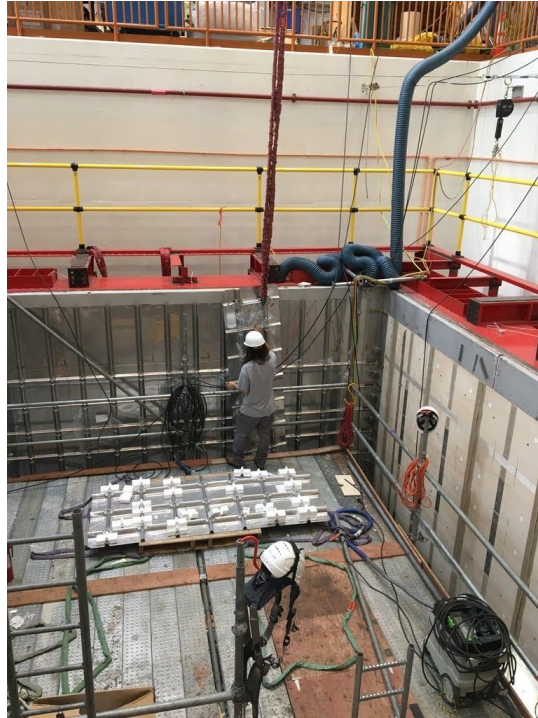
Installation of panels under the scaffold legs



Glueing of strips to seal secondary membrane



Cryostat Installation: Primary Insulation Panels & Primary Membrane



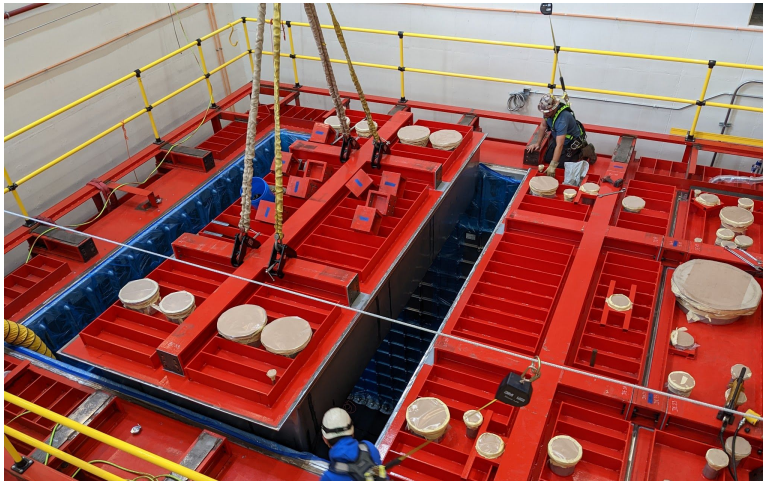
Cryostat top cap



Cryogenic top cap installed & welded to the cryostat



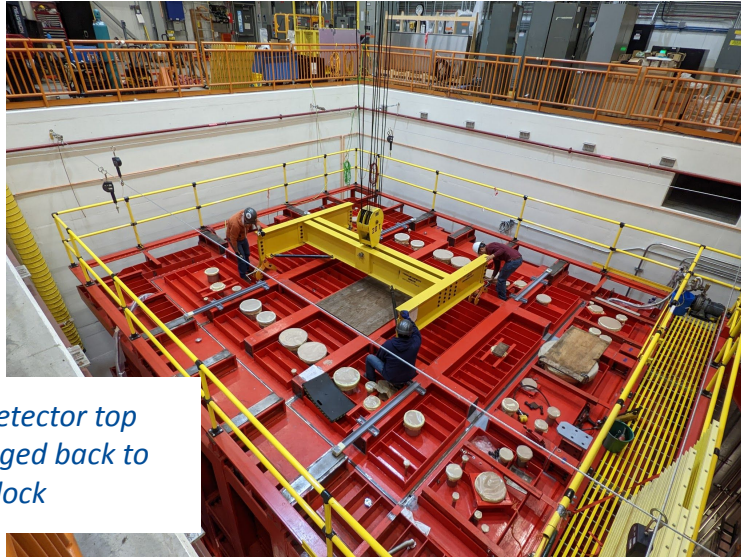
Top cap arrived in four pieces. All needed to be flipped before installation.



Alignment of top cap pieces, before assembly of 3 pieces into one detector top cap



Cryostat top cap



Assembled detector top cap being rigged back to the loading dock



Practice for final detector rigging! (there will be more...)



Detector top cap is ready to be attached to the detector



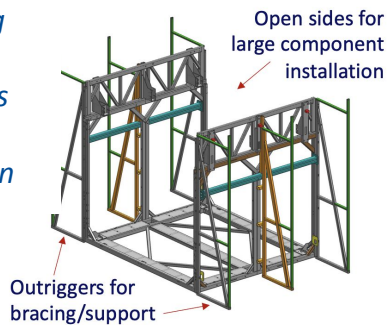
Cryostat is ready for internal cryogenics piping installation (starting this week!)

Next: SBND On Tour

- We are finalizing the last details in planning the move of the detector from DAB to SBND
 - We have been planning this for years!
 - We have also been practicing for this!
 - In the middle of a review with external reviewers (following new FESHM draft chapter 10210)
- Target is around Thanksgiving... we will make an announcement so you can follow our move from onsite, the WH window, or online

Assembly configuration of atf

Reconfiguring the atf in the coming weeks for transportation



We practiced the move out of DAB with an empty atf in December 2019

Fork truck pulling detector

atf

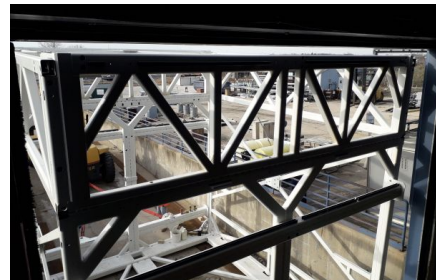
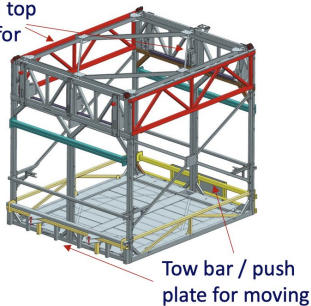
Fork truck acting as a brake



We did three practice runs with empty and loaded trailers for two potential routes on site during the past two months

Transportation configuration of atf

Side and top bracing for rigidity



Summary

- SBND completed the detector & cryostat installation this summer!
 - the installation progressed on the schedule made at the beginning of 2022
- We are preparing for moving our detector to the SBN Near Detector Hall
- Thank you to our fantastic engineers & techs from the TSD!

