



SBND Installation Status

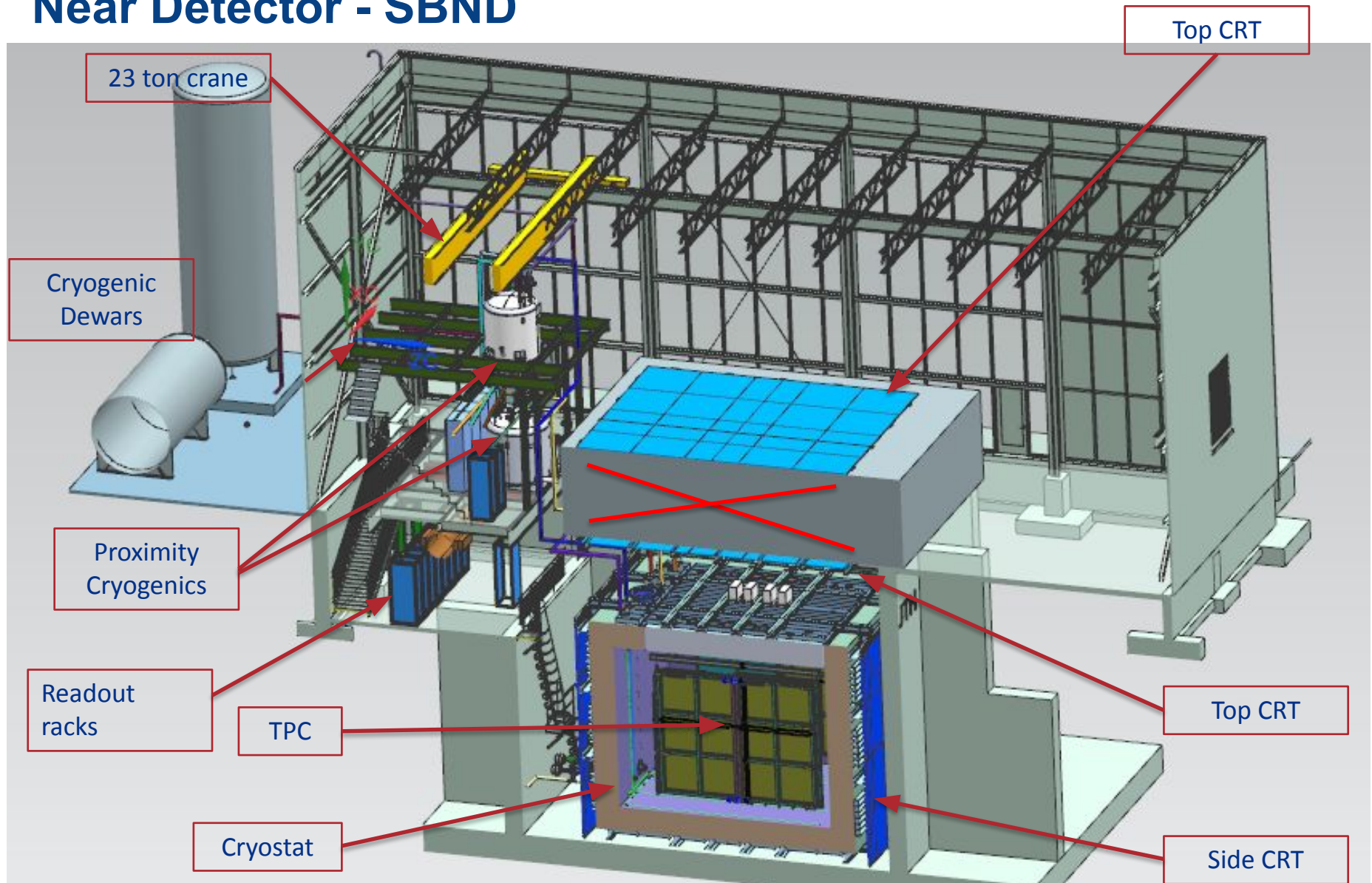
Anne Schukraft

SBN Oversight Board Meeting

June 9, 2023

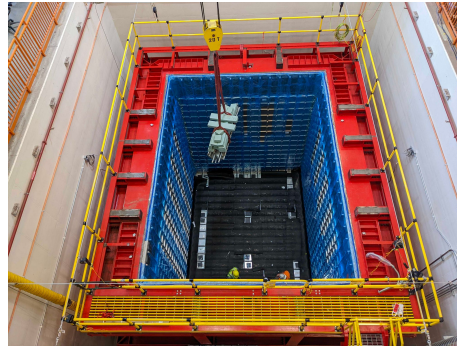
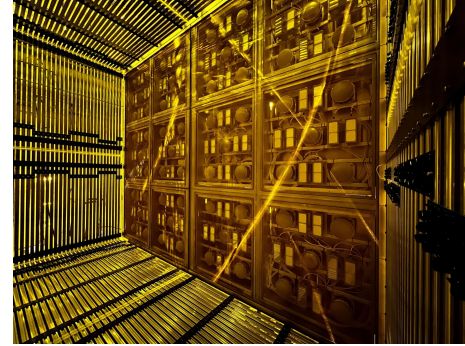


Near Detector - SBND



High-level Status

- TPC Assembly **Complete**
- PDS System Installation **Complete**
- Cryostat installation **Complete**
- Internal Cryogenics Installation **Complete**
- Top Cap Assembly **Complete**
- Detector Move **Complete**
- Post-Move Detector QC **Complete**
- Detector & Top Cap Coupling **Complete**
- Detector insertion into Cryostat **Complete**
- CRT North Wall Installation **Complete**



Detector Rigging Preparations

Prior to rigging the detector into the cryostat, all subsystems completed another QC check

- Installed last part of optical fibers for the PDS calibration system
- Installed PMT flanges & PMT repeated QC
- X-ARAPUCA system pulled cables through the top cap and QC
- All CE FEMBs were re-tested after pulling CE cables through the top cap
- Wire bias system was checked out again, after solving problems with bad connectors between wire bias filter boards;
- Performed another test fit of the HV donut & installation practice



Installation of PMT feedthroughs



Camera and temperature probes inside the cryostat.

Installation of Instrumentation

- 12 RTDs on the detector, 42 RTDs on the cryostat walls + underside of top caps
- 5 cameras (4 on the cryostat walls, 1 on the detector) & several LED strips for lighting
- 2 liquid level probes on the cryogenics top cap
- CERN team installed strain gauges

Detector Rigging

- The detector was successfully lowered into the cryostat on Tuesday, Apr 25
- Thanks to planning by our Installation Coordinator Roberto Acciarri & Project Engineer Dave Pushka, the operation went very smoothly and completed within the morning
 - thanks to FNAL technicians John Najdzion & team, and Tom Wicks & team
 - thanks to our DSO, as well as fire department, & ISD for providing an emergency generator for the crane
- Very useful in the preparation process was an internally organized technical review, which was held March 15th



Detector Rigging

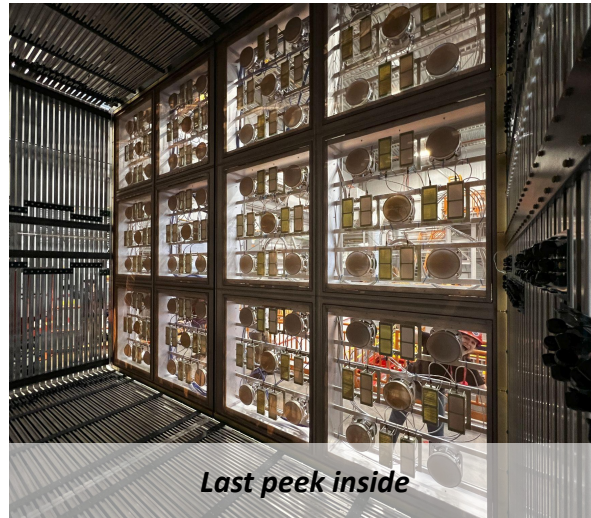
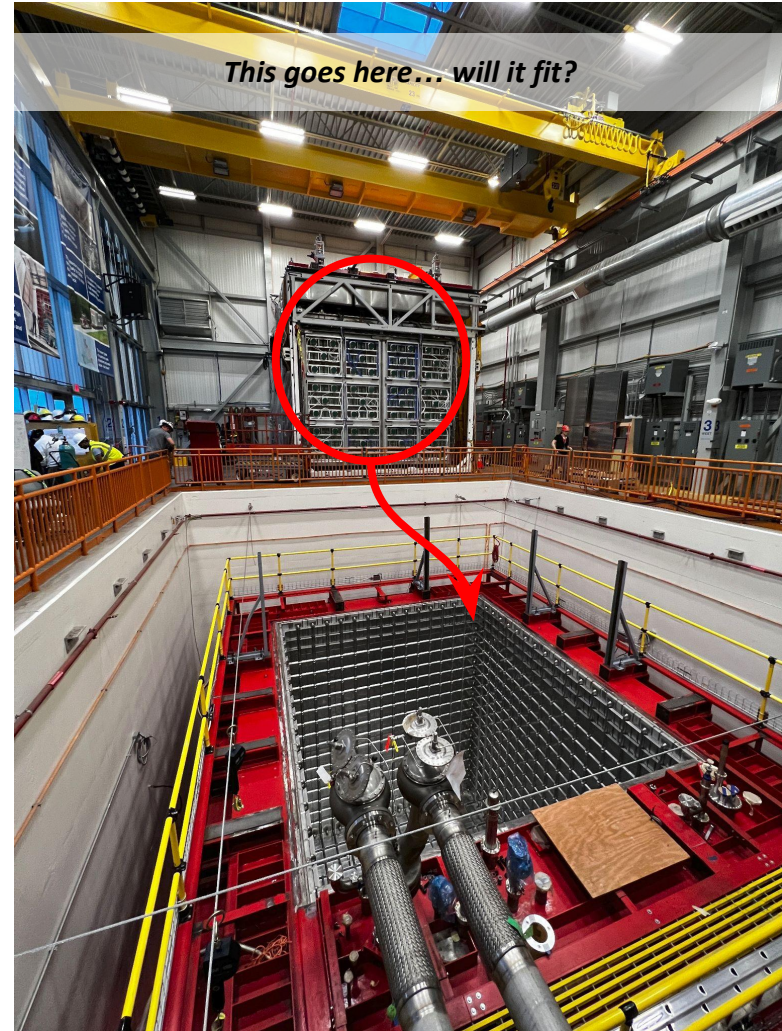
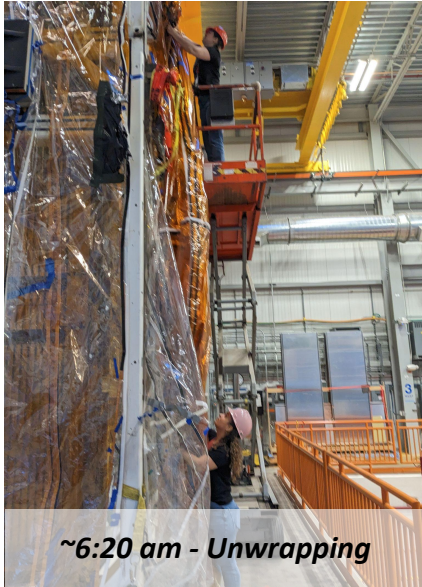
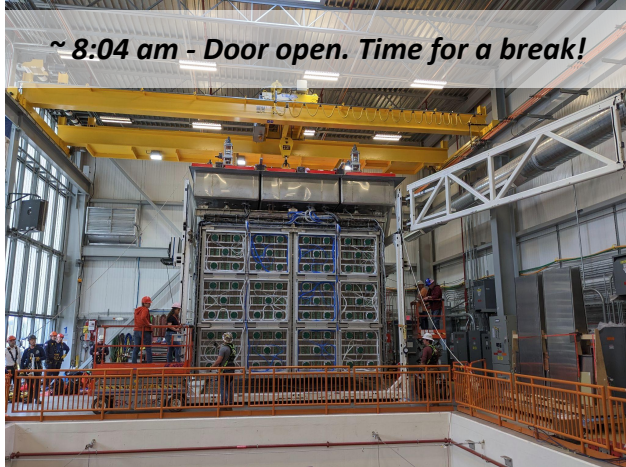


photo series courtesy of Roberto Acciarri

Detector Rigging

~ 8:04 am - Door open. Time for a break!



Dream Team Selfie Time



Meanwhile, Fire Department gets ready for anything may happen...



~ 8:30 am - Adjusting TPC for extraction



~ 9:00 am - Removing guardrails



Last guardrail coming out



Detector Rigging



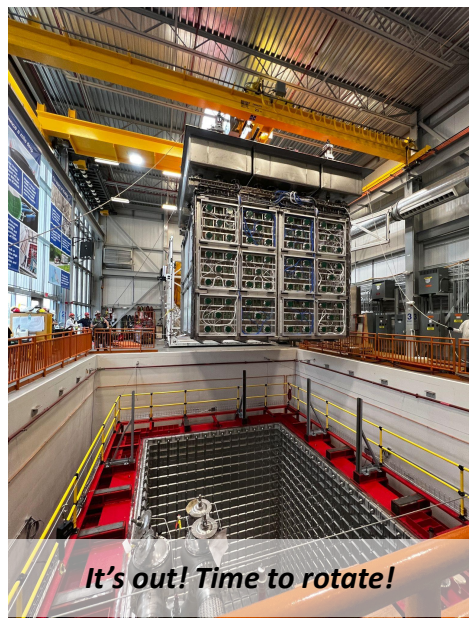
~ 9:05 am - Start TPC extraction



Working at the PIT cutting edge...



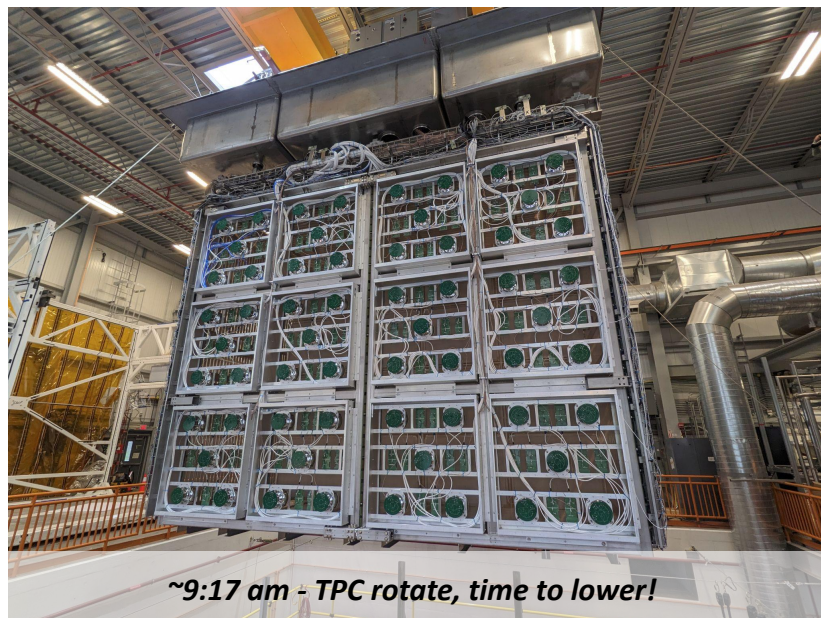
Almost out...



It's out! Time to rotate!

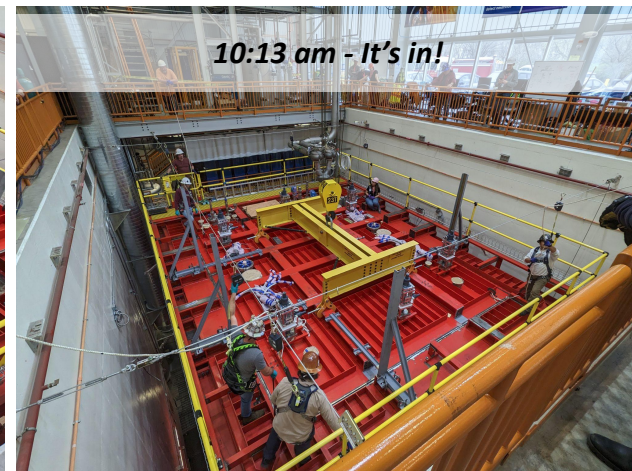
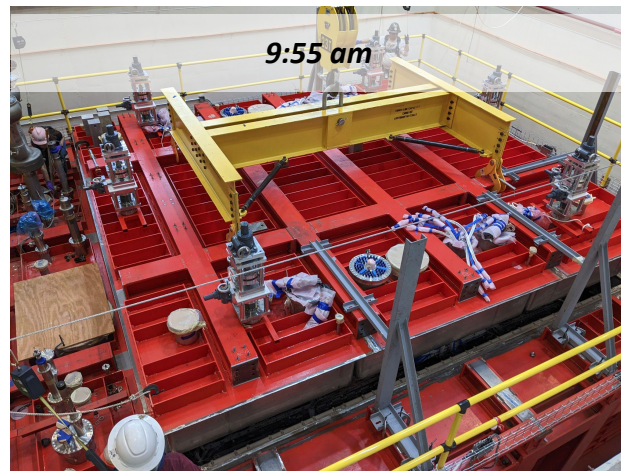
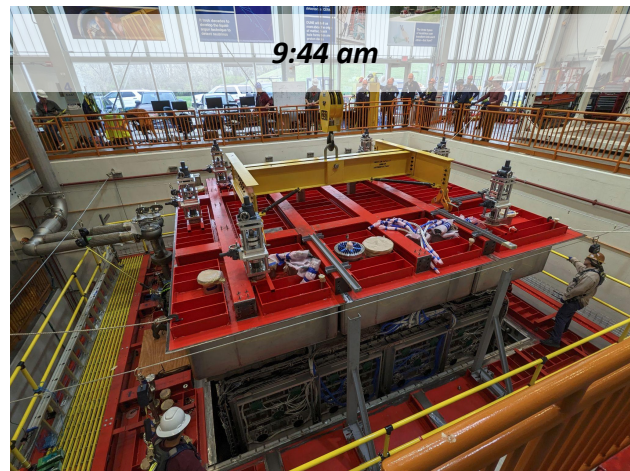
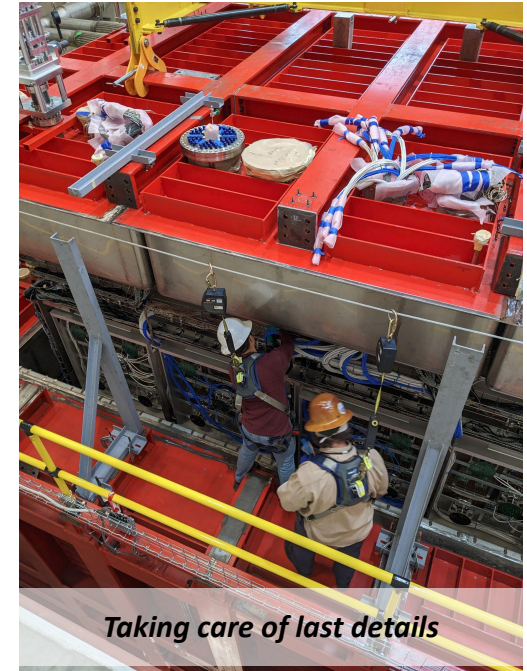
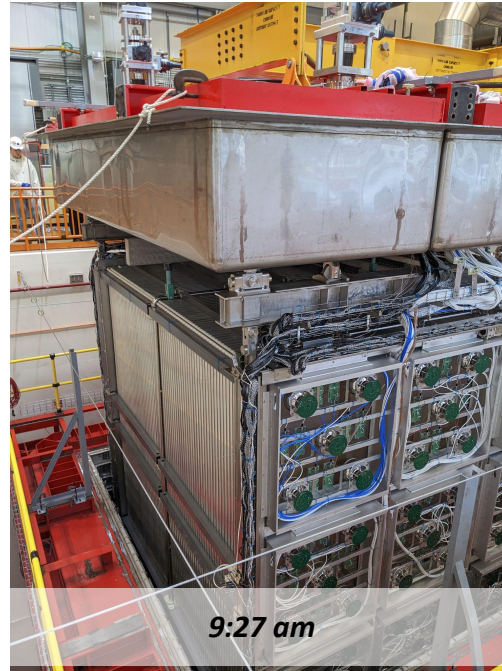


90° rotation



~9:17 am - TPC rotate, time to lower!

Detector Rigging



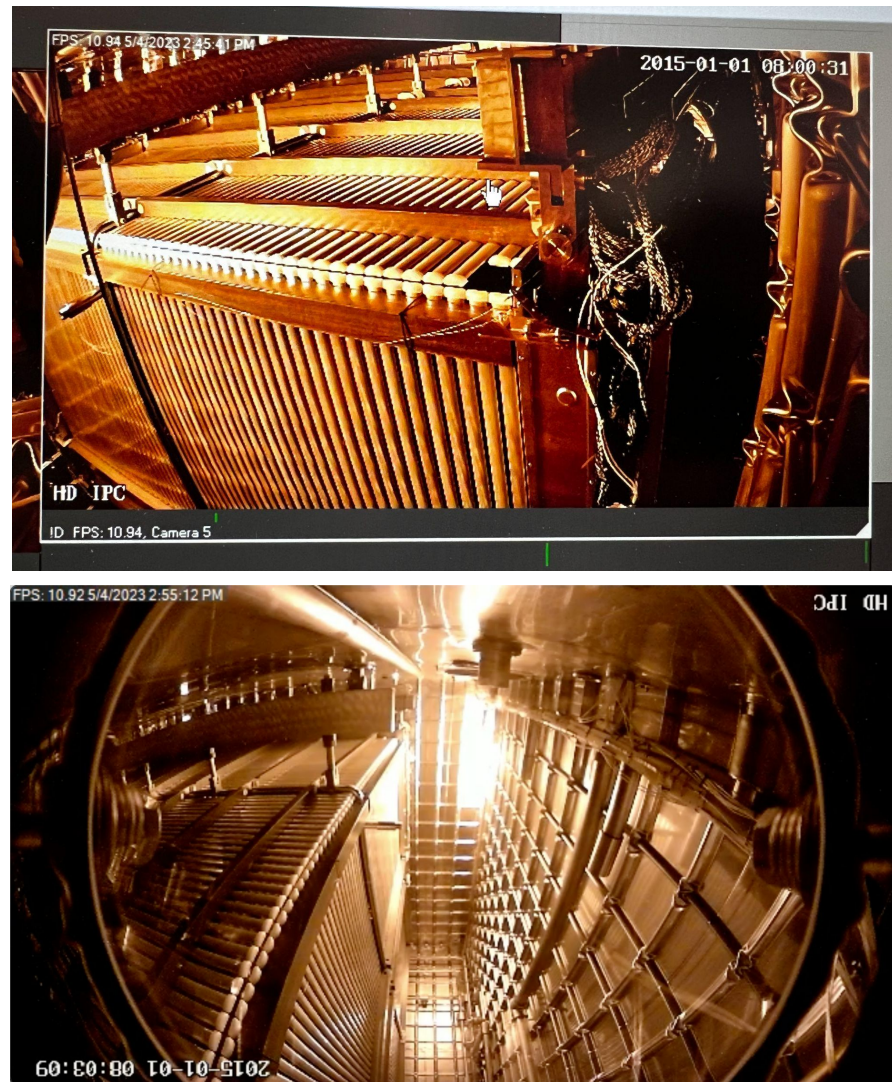
Detector Rigging

video credit: FNAL Visual Media Services
Download from [SBN DocDB 31466](#)



Preparing for top cap welding

- Flange installation
 - X-ARAPUCA & PMT flanges installed (2 each)
 - TPC laser flanges to be installed next week (4)
 - TPC flanges to be installed June 20 (4)
- Repeating QC tests
 - PMT Checked out
 - X-ARAPUCA, Cold Electronics and Wire Bias QC ongoing
 - Field Cage QC test to be repeated after first cryostat access
- Preparing for cryostat access through access port on top cap
 - install cathode probe to repeat FC test
 - confirm positioning of the TPC inside the cryostat
 - install HV donut arm



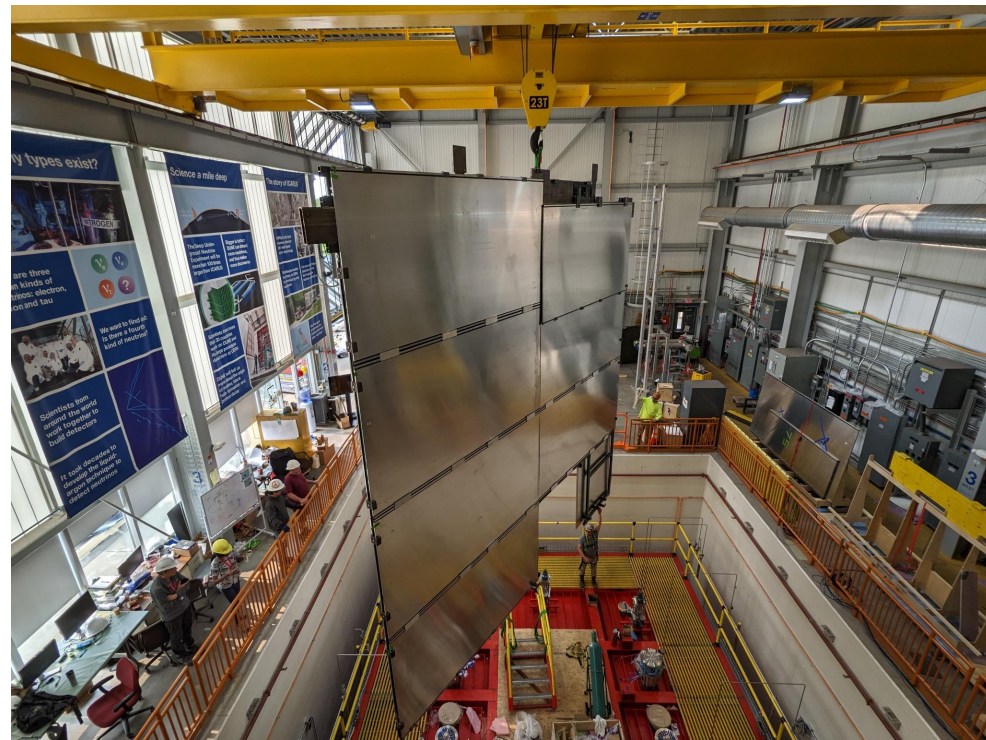
First images from inside the cryostat.

CRT North Wall Installation

- Installation of the CRT North Wall is complete
 - The North Wall has to be installed prior to finalizing cryogenics piping connecting to the cryostat; East, West and South Wall will be installed only after successful cryo operation is established, using same method
- 18 CRT modules have been tested & characterized on an A-frame setup to be installed on the North Wall
- The North wall was assembled as a whole on the loading deck prior to installation
- The entire wall was rigged into place and hung from the North Wall steel support posts



Modules being tested on A-frame & CRT wall module installation



CRT Wall Rigging

Cryogenics Installation Progress

- Cryogenics Installation Progress
 - Gas analyzer system installation in progress
 - Warm GAr collection system installation complete
 - Only part remaining is connection to top of cryostat
 - Insulation Nitrogen purge system almost complete
 - In-line PrM line completed and vacuum jacket leak-checked
 - Vacuum jacketed transfer lines that connect the cryogenics system to cryostat are on critical path
 - delay in the delivery of bellows and ceramic isolators to TechniFab from supplier
 - Received a partial delivery of 21 of 36 parts in May; installation of these starting now
 - expected final delivery in August/early September
- Pressure test for Ar Dewar and connecting piping ongoing
- *LAr delivery contract placed with Air Products*
 - on schedule and under budget
 - same vendor as MicroBooNE and ICARUS fills



Warm GAr system

Remaining Subsystem Installation

- All parts for the TPC Calibration laser system have been received from Bern
 - installation of feedthroughs scheduled for next week
 - Laser testing (Class IV), rotation motor testing & electronics installation to happen in July/August
- HV Production Feedthrough testing ongoing at NLTF



*HV FT Test Setup in
BLANCHE @NLTF*



Purity Monitor Test Setup at NLTF

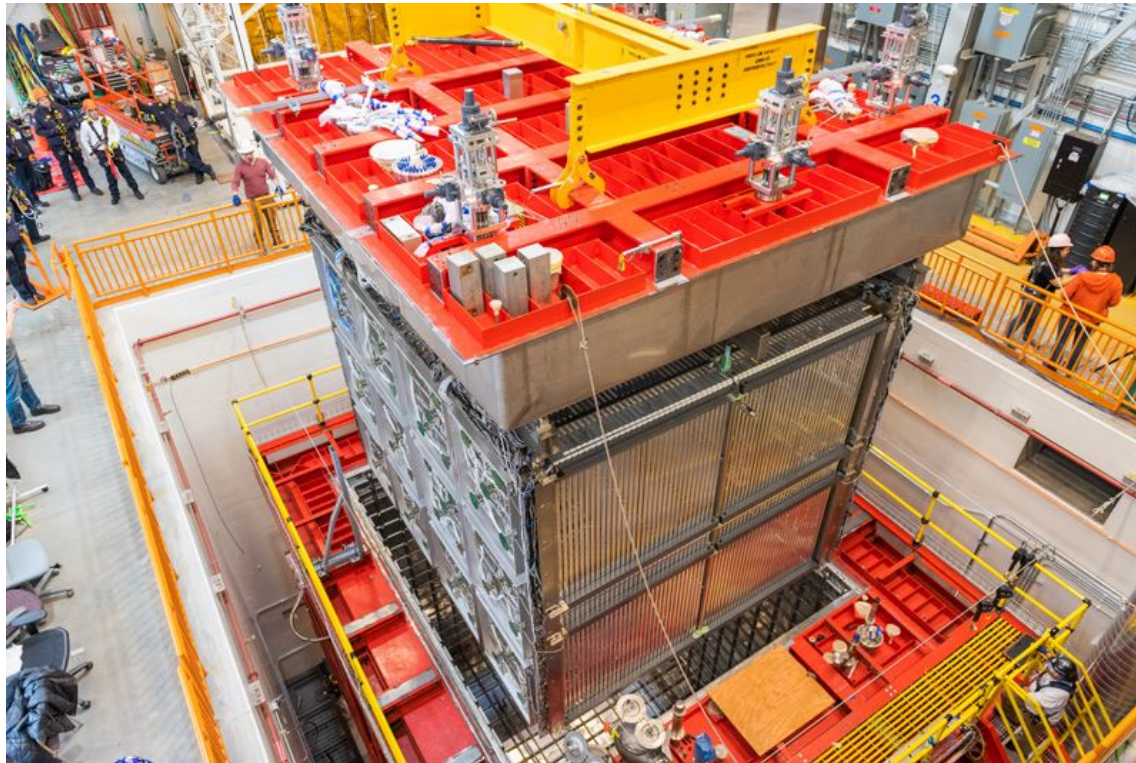


Laser Feedthrough Test Assembly @Bern

- Purity Monitors
 - inline and cryostat-internal purity monitors being tested at NLTF (fka PAB)

Summary

- SBND recently accomplished the insertion of the detector into the cryostat & installation of the CRT North Wall
- The LAr delivery contract has been placed
- Next upcoming milestone is the welding of the cryostat top cap planned for early July
- Cryogenics commissioning is forecast to start around September



Backups