ArgonCube

UNIVERSITÄT BERN
AEC ALBERT EINSTEIN CENTER FOR FUNDAMENTAL PHYSICS

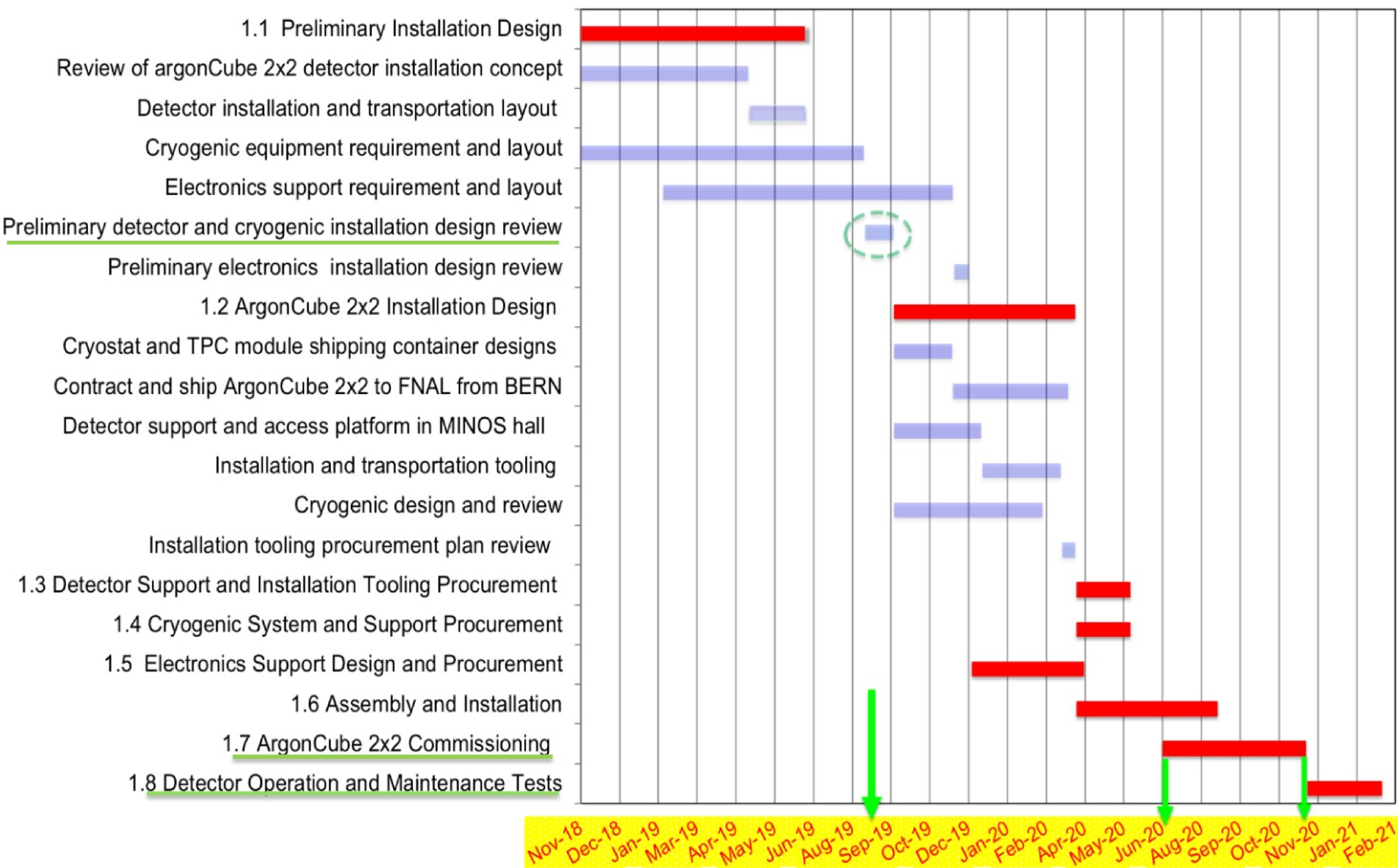
Responsibilities & Timeline (Discussion Fuel)

Cubism - Braque’s Bottle and Fishes, Paris c.1910-12

Collaboration Meeting
Bern, March 2019
James Sinclair, LHEP

15
TON

Schedule in Graphic



LArPix-v2 Schedule

To meet 2x2 Demonstrator needs, 2019 schedule is aggressive:

Move directly to full ASIC production (skipping small-scale pre-production)

- Engineering production of ~7500 v2 ASICs (Mar. → *slipping to Apr.*)
- Limit v2 modifications to only those that are necessary and low-risk.
- Postpone other desired changes for future v3 ASIC

Component testing:

1) Detailed characterization of the unpackaged LArPix-v2 ASIC (Jun)
2) Detailed characterization of the packaged LArPix-v2 ASIC (Jun-Jul)
3) LArPix-v2 ASIC qualification (Jun-Oct)
   Targets: Jun ~100-200 ASICs; Aug ~2000 ASICs; Oct ~8000 ASICs
4) Unloaded Pixel tile PCB qualification (May-Oct)
   Brief assessment of each PCB before component/ASIC loading.
   Targets: Jun ~5-10 small prototype tiles; Aug ~20 tiles; Oct ~72 tiles

Pixel tile testing:

1) Prototypes tile testing (Jul-Aug)
   Test a small number (5 to 10) small-scale (maybe ~16cm x ~16cm, ~25 ASICs) prototype tiles using the v2 ASIC.
   Key questions:
   - Is tile design adequate?
   - Is additional ASIC qualification (e.g. cryo socket testing) needed before tile assembly?
2) Initial full-scale tile testing (Sep-Nov)
   Test a moderate number (~20) of production scale (~32 x ~32, ~100 ASICs) pixel tiles.
   Send to Bern and install in first 2x2 module.
3) Remaining full-scale tile testing (Nov-Feb)
   Test enough (~52?) of production scale pixel tiles to instrument the 3 other 2x2 modules, plus ~10% spares.
   Send to Bern and install in the remaining 2x2 modules.

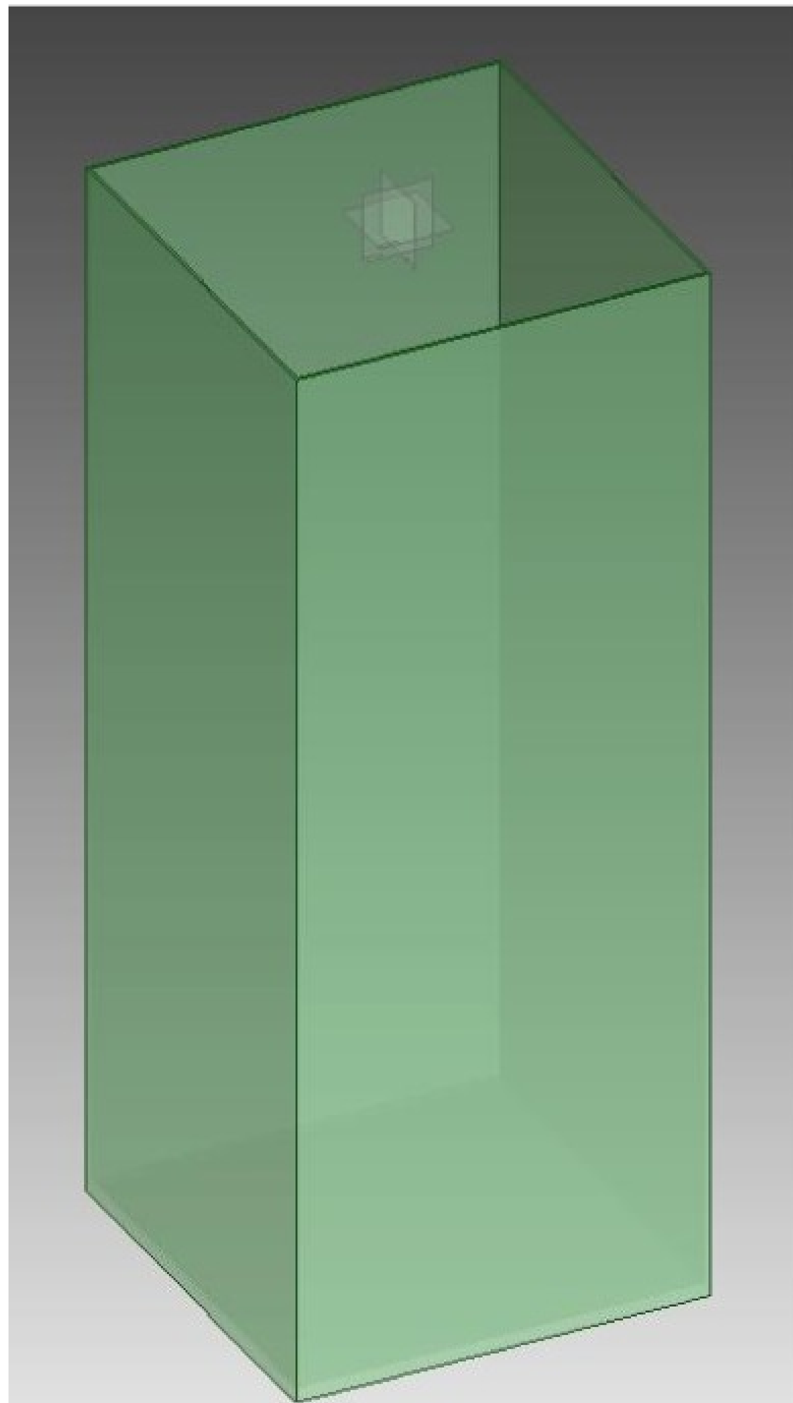
SAN FRANCISCO ZOO
CALIFORNIA

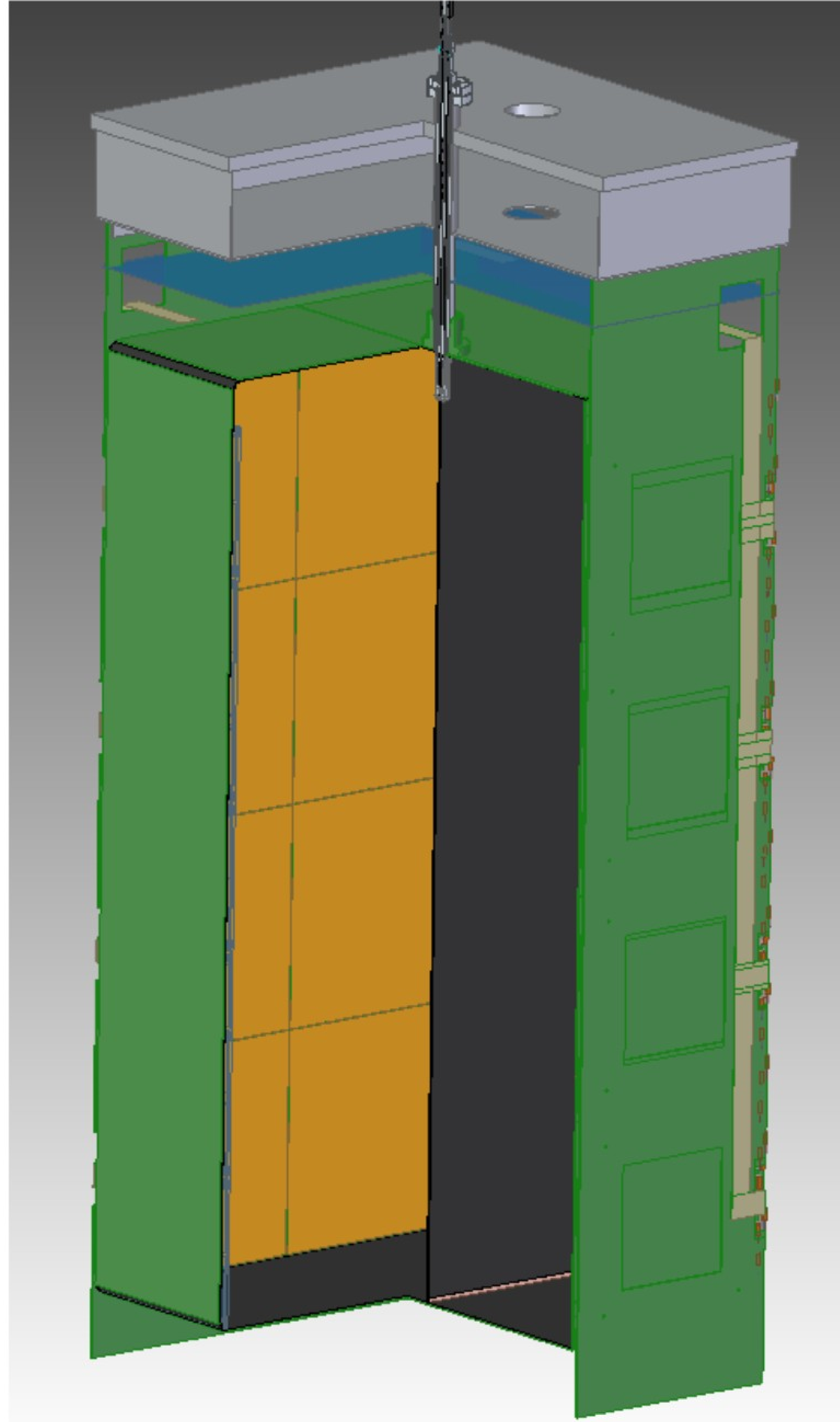
Knut’s ArgonCube Modue in chalk, Bern 2019

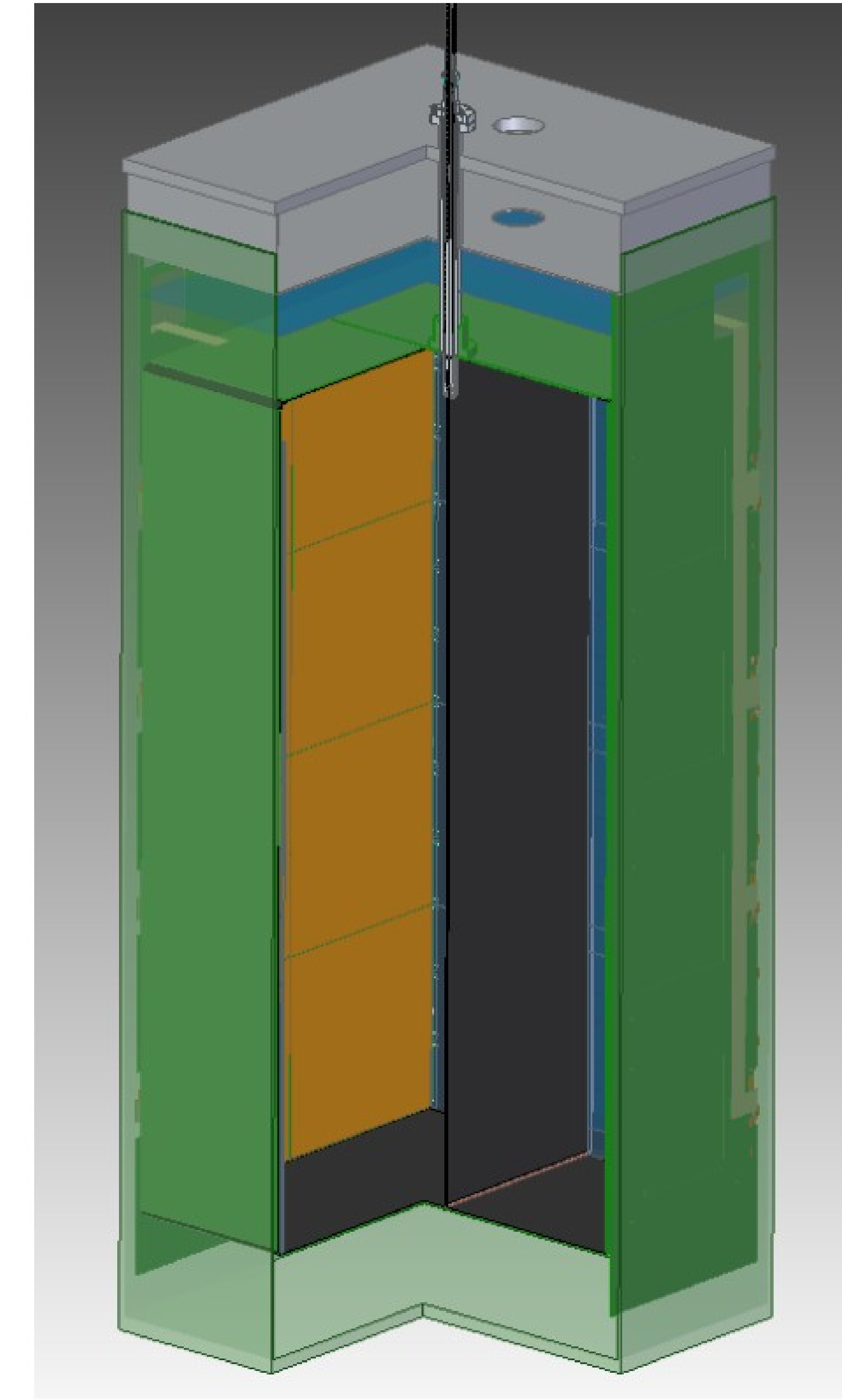
Naked TPC hangs under insulating “pillow”

Many updates already implemented bus still must be tuned-

Fiberglass “bucket” is hermetic
(check valves on bottom)







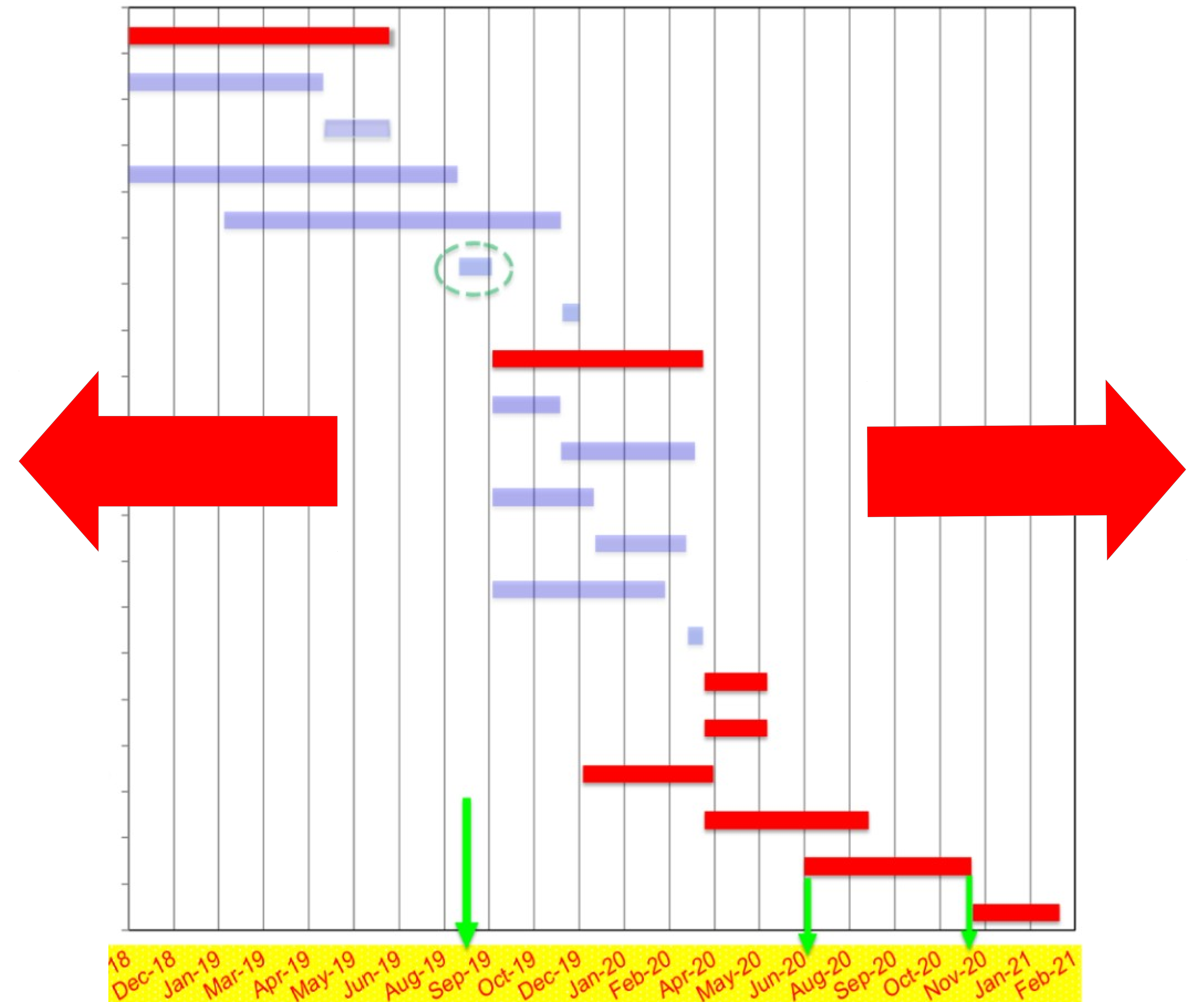
Fiberglass bucket bonds to pillow with shearable bond for removal

Next - Interface Definitions

Interfaces have to be defined between individual components, along with test schemes of of interfaces.

- Charge R/O
- Light R/O
- TPC + HV
- Cabling
- Module Structure + Cryostat
- DAQ (event builder)

Resources loaded plan has now to be written incorporating all these, and integrate with Ting’s (expanded, NOT extended).



2x2 Points of Contact (interface responsibles)

Module Structure + Cryostat – James, Bern

Charge R/O – Dan, LBNL

Light R/O – Nikolay, JINR

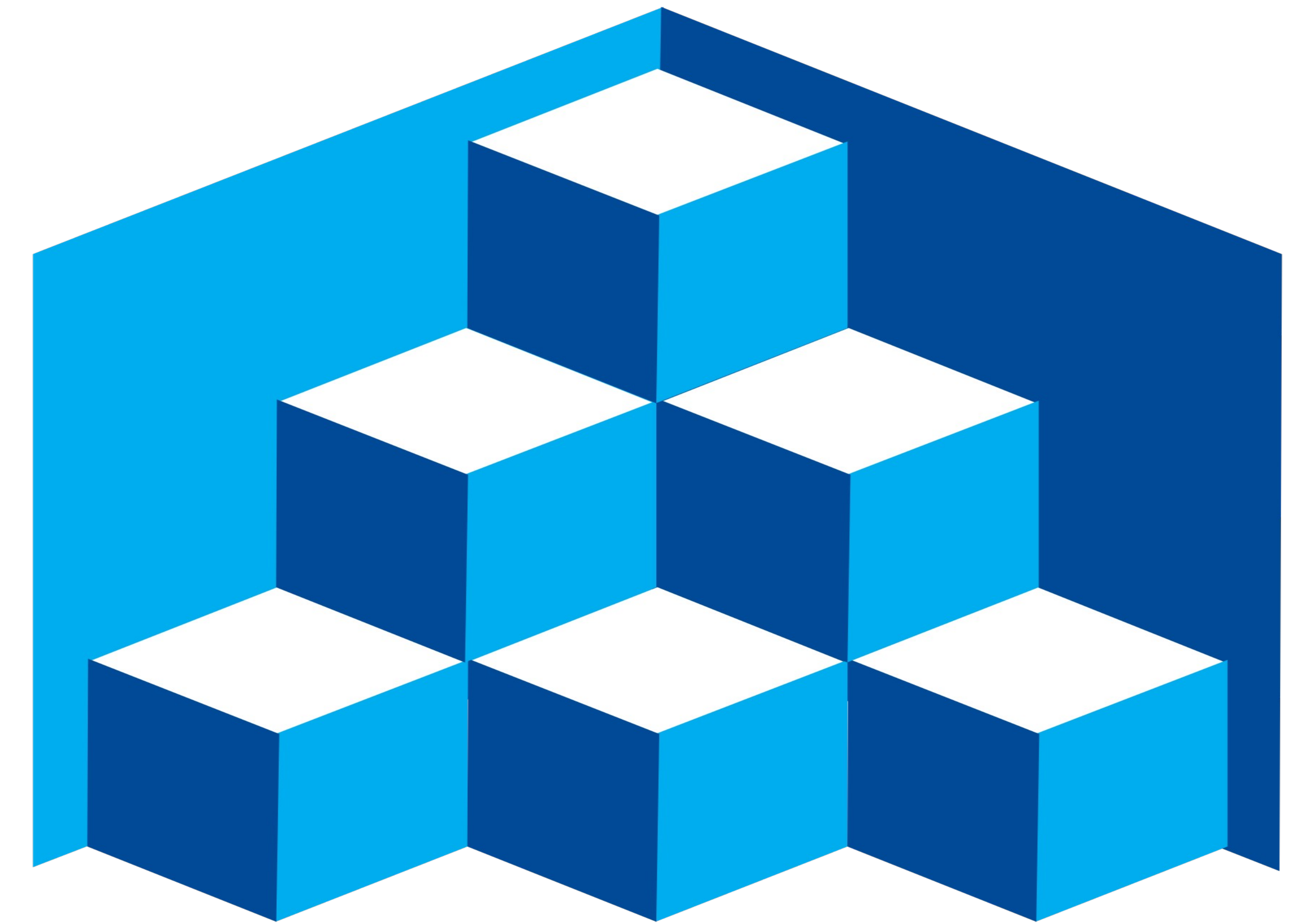
TPC + HV – Ran, SLAC

Cabling – Jonathan, UTA

DAQ + Beam trigger – Clarence, Rochester

FNAL installation – Ting, FNAL

Simulation – Kazu, SLAC



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Calibration – ??