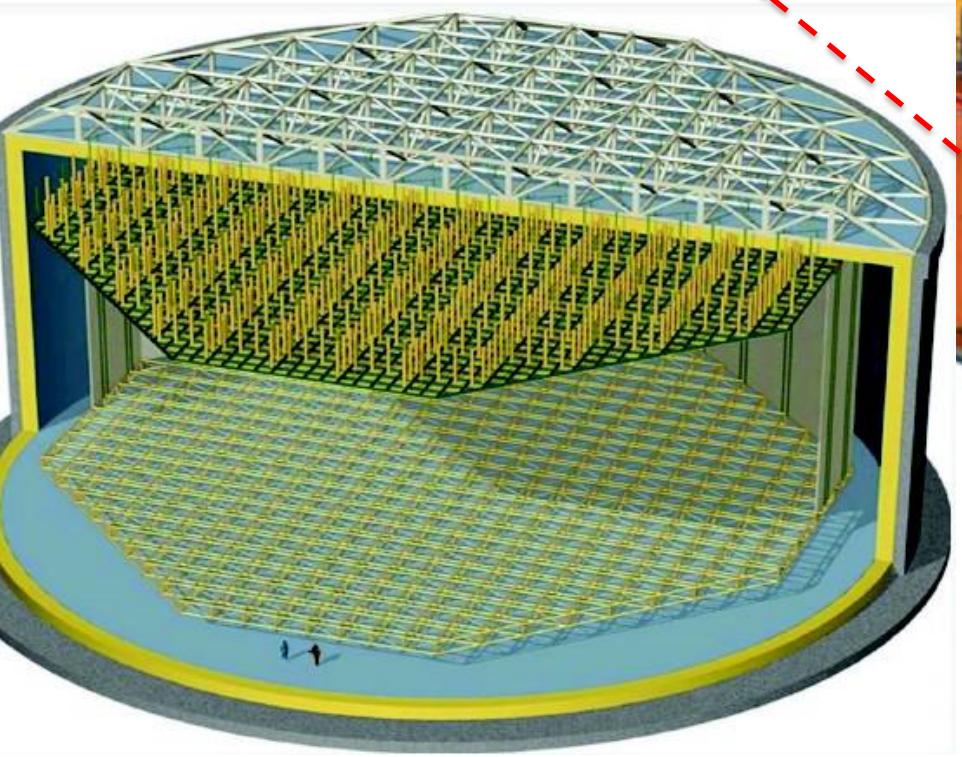
How CERN can help ?

M.Nessi, 13-1-2015



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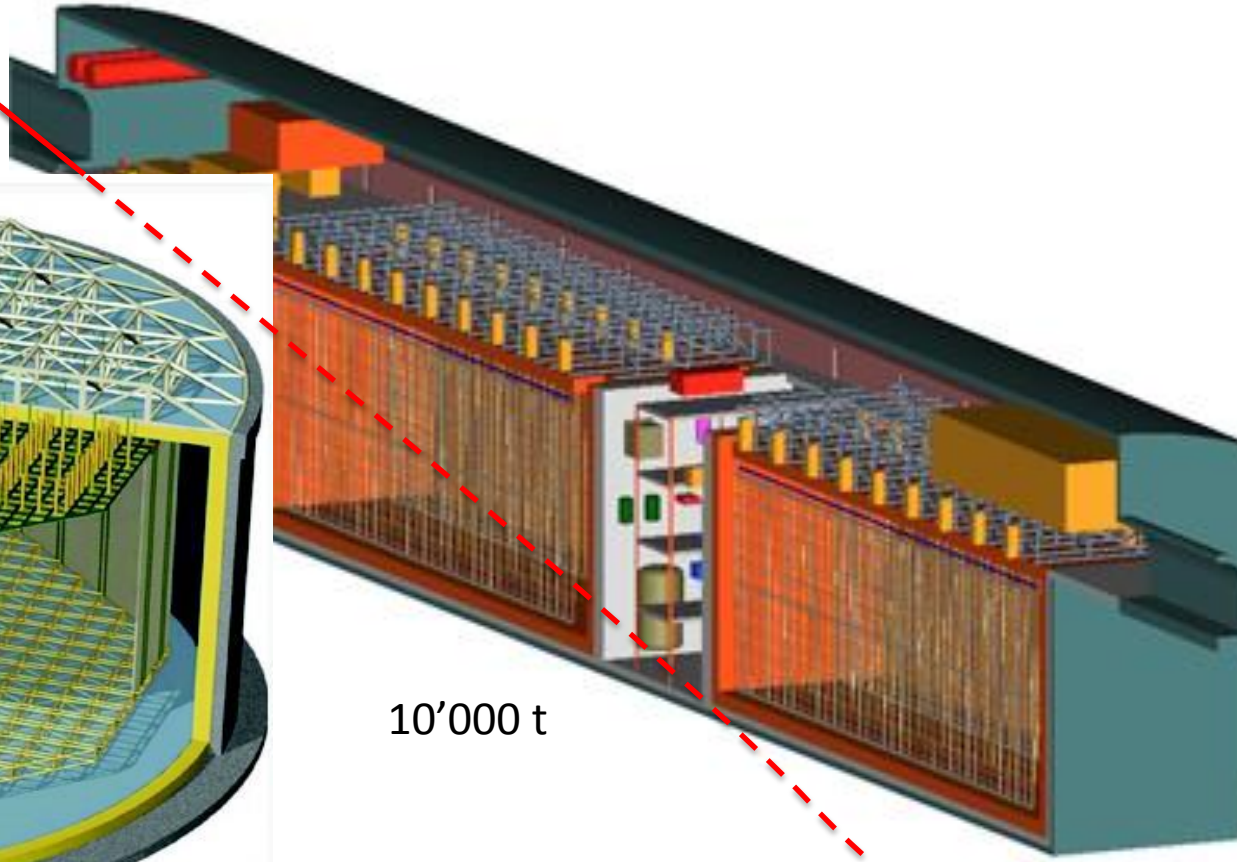

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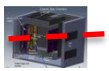
35 t

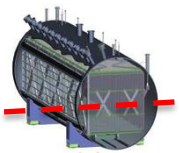


now

50 t

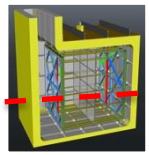
now’

170 t

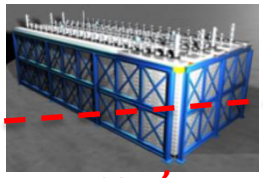


now

220 t

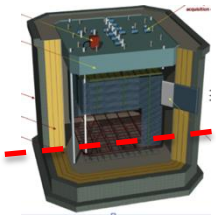


760 t



now’

705 t



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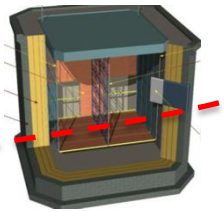

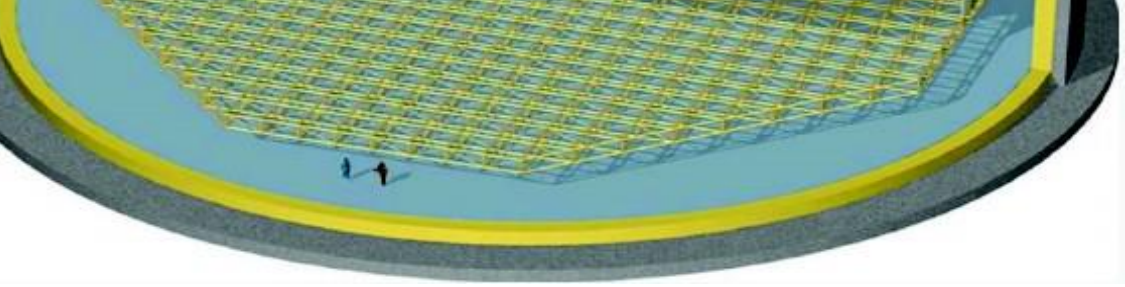

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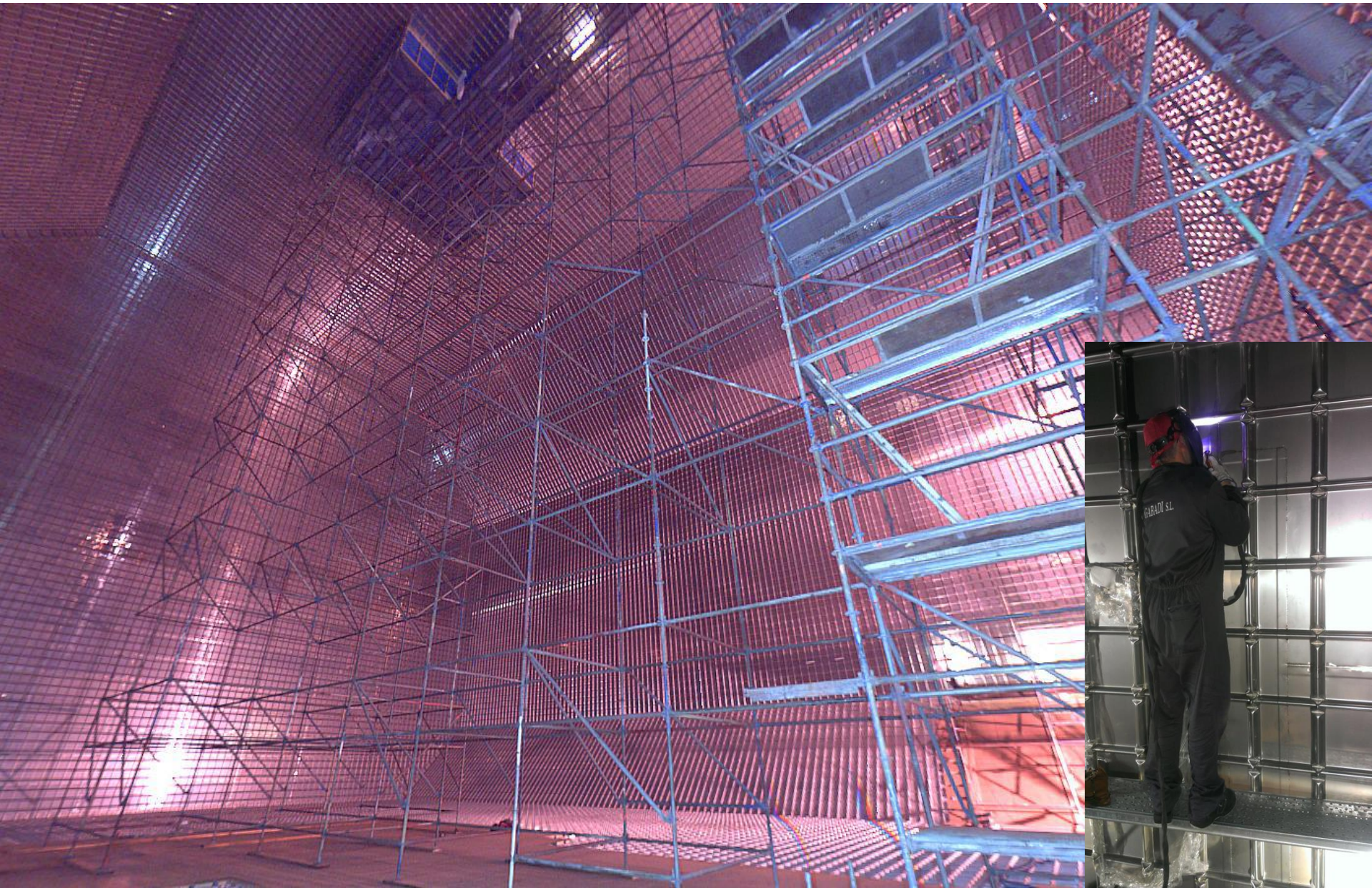
R&D — Short Baseline — NA61 — CERN ν Platform →

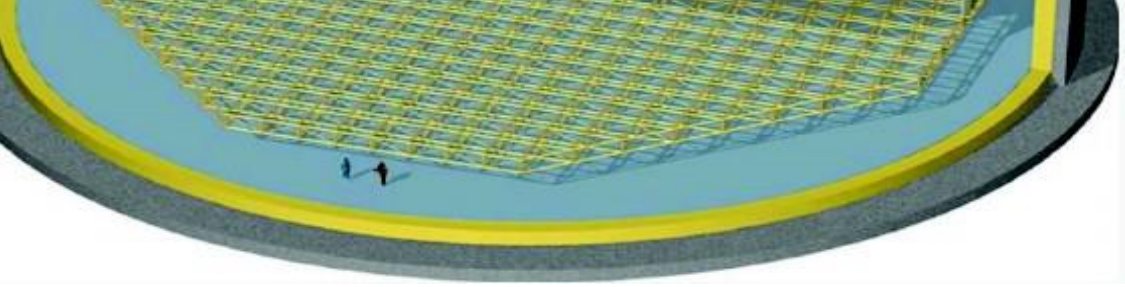
To succeed do we need to proceed in steps ?

YES !!! In steps for the next 3-4 years

- To optimize the TPC single phase technology, beyond what was done by ICARUS, MICROBONE, LARIAT and LBNE
- To prove the potential of a 2 phases LAr TPC
- To gain experience on new techniques for light detections in LAr
- To calibrate the response to hadrons and leptons
- To learn how to deal with all nu-e possible topologies
- To optimize the detector modularity and integration process
- To gain experience on membrane cryostats construction
- To learn the cryo-techniques necessary at the multi kt scale
- To exercise and learn about data automatic reconstruction and large data set handling (PBytes)
- ….

Membrane cryostats (GTT licence)





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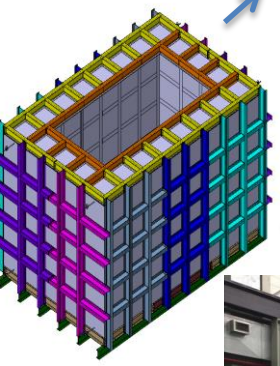
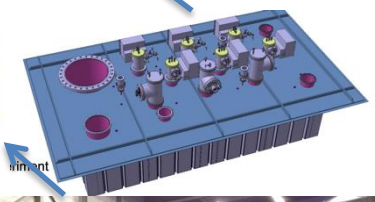
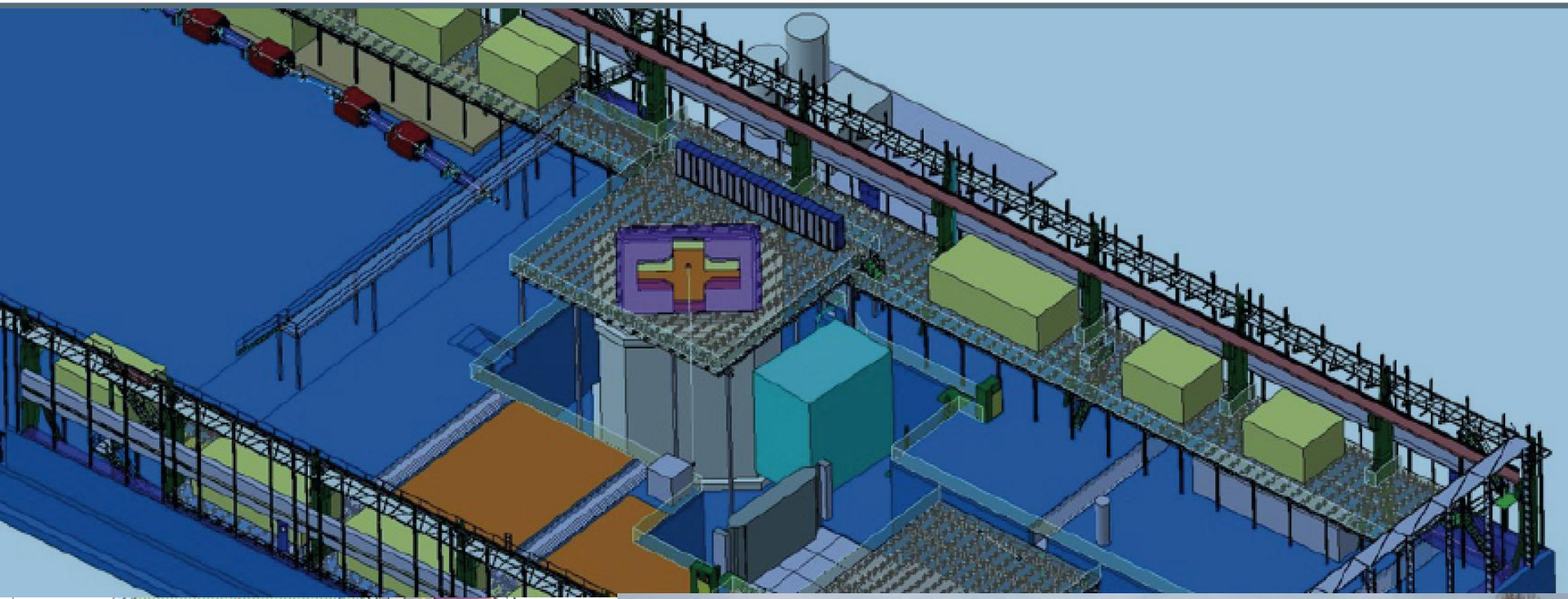
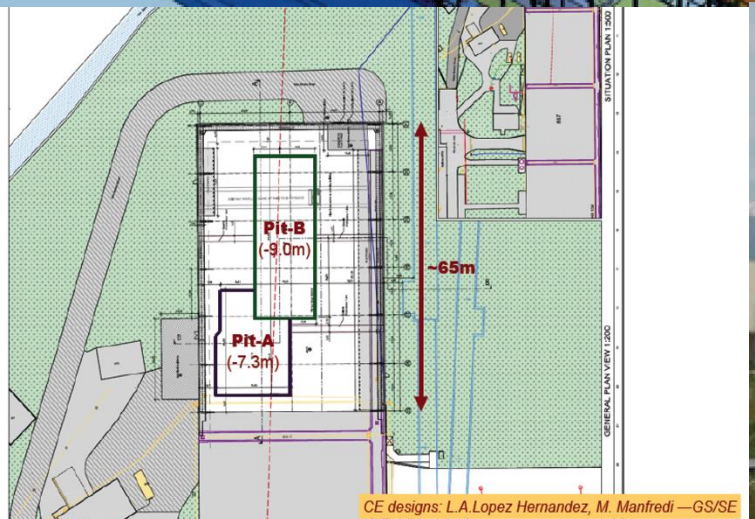




- ✓ *We are constructing the first cryostat (April)*
- ✓ *Learning the lesson and finding solutions*
- ✓ *Finding and solving all procurements issues*
- ✓ *With a frame conctract with GTT*
- ✓ *Then 4 more cryostats (2015-2017)*
- ✓ *And a cryogenics which follows (new cryo group !!)*

EHN1 extension (test beam and test facility)

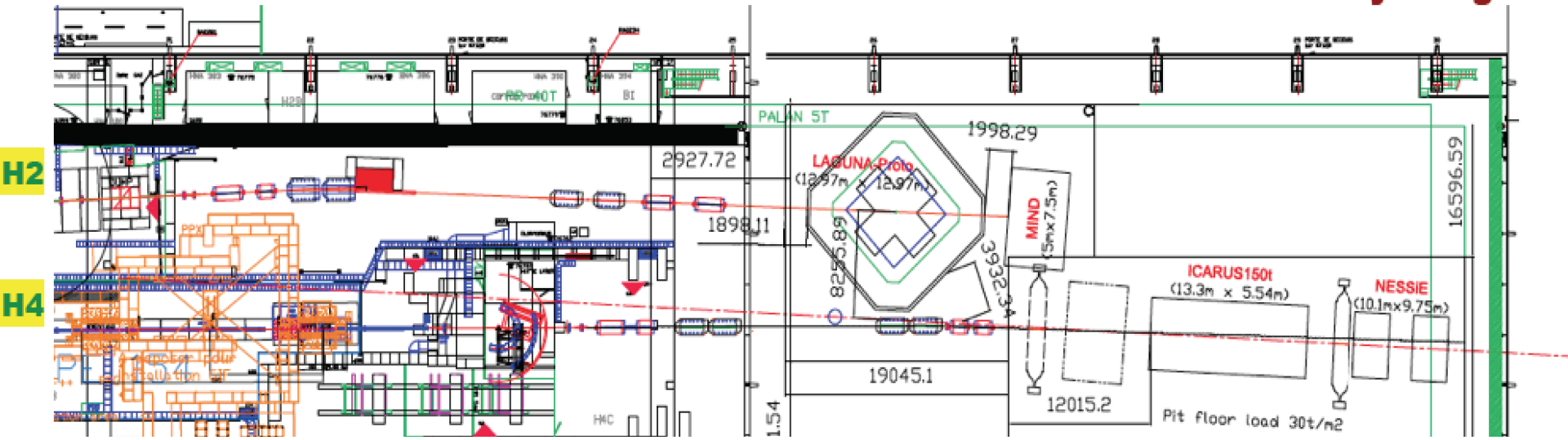


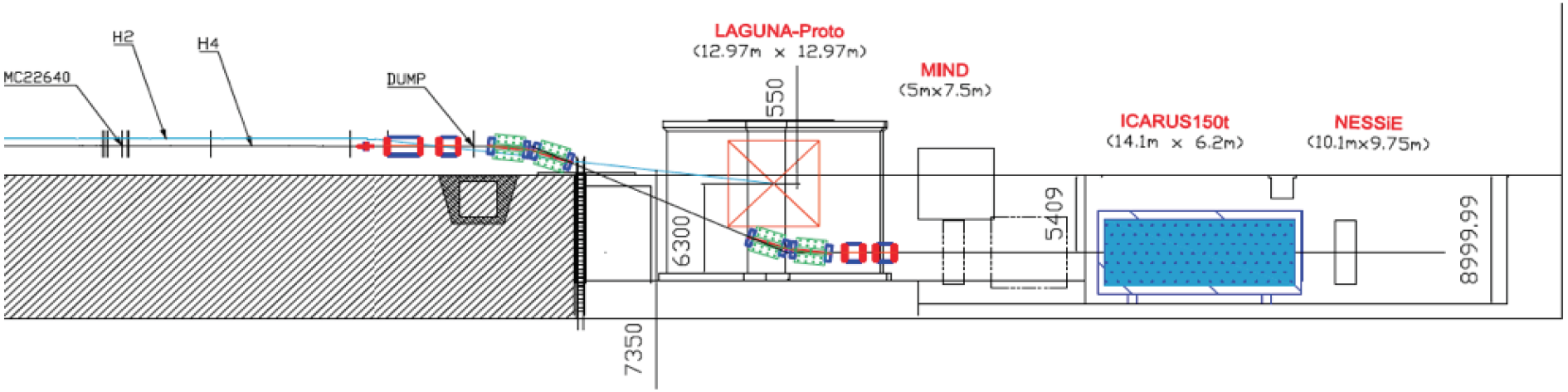


Charged tertiary beams

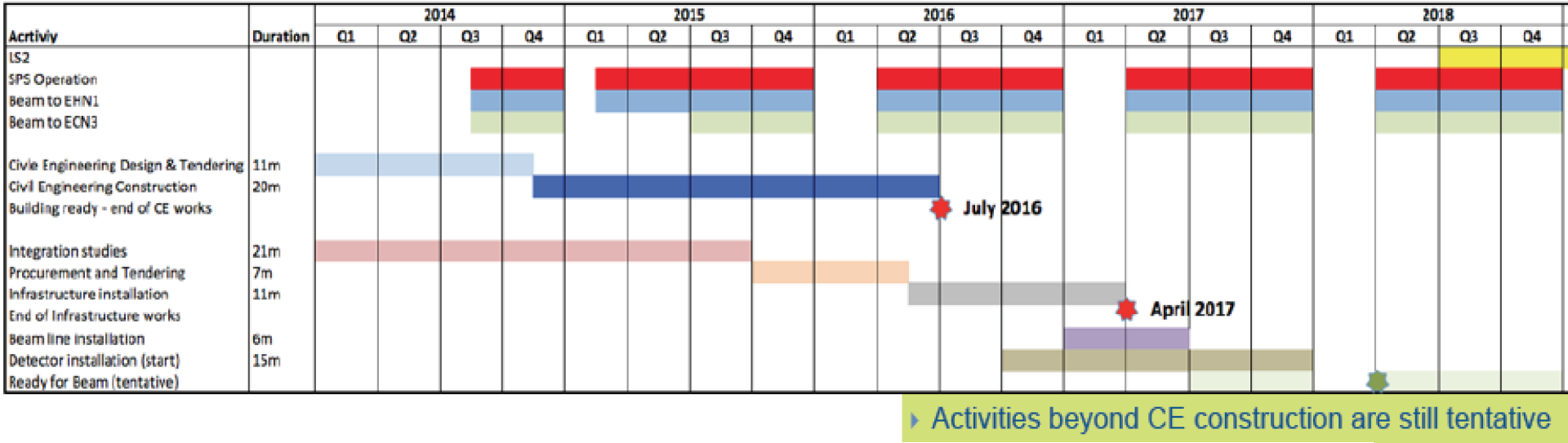
- H2 extension: **1-20 GeV/c**, hadrons ($\pi^{\pm}$, $\mu^{\pm}$, p - mixed beam), electrons($e^{\pm}$)
- H4 extension: **1-5(7) GeV/c**, hadrons ($\pi^{\pm}$, $\mu^{\pm}$, p - mixed beam), electrons($e^{\pm}$)
  - interest to go lower, down to 0.2 GeV beams for LBN TPC test

Preliminary designs!





EHN1 extension



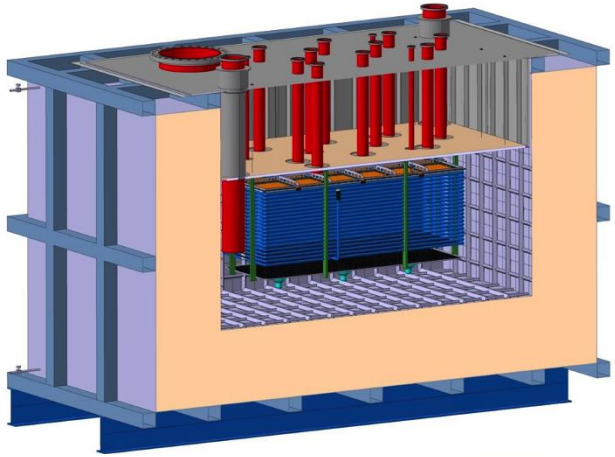
Target dates :

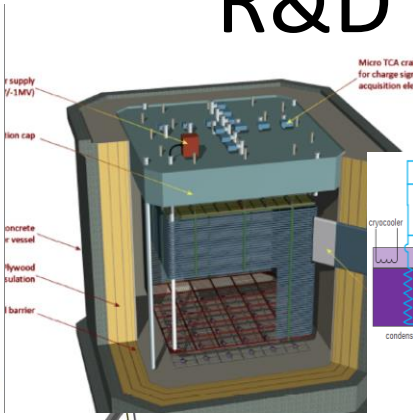
- CE works completed : July 2016
- Infrastructure completed : April 2017
- Ready for beams for 2017/2018 run

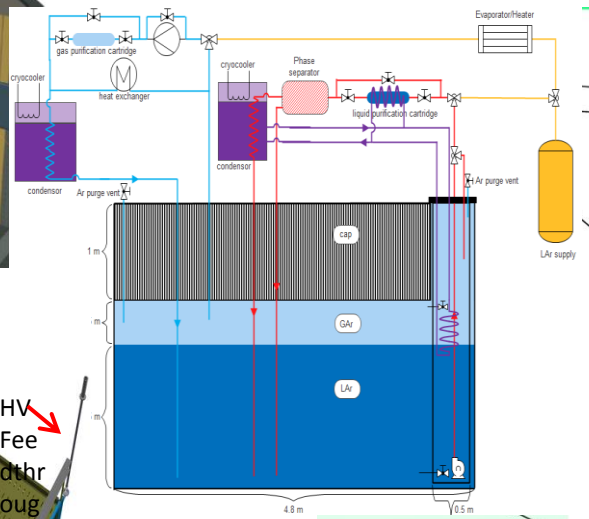
Useful services :

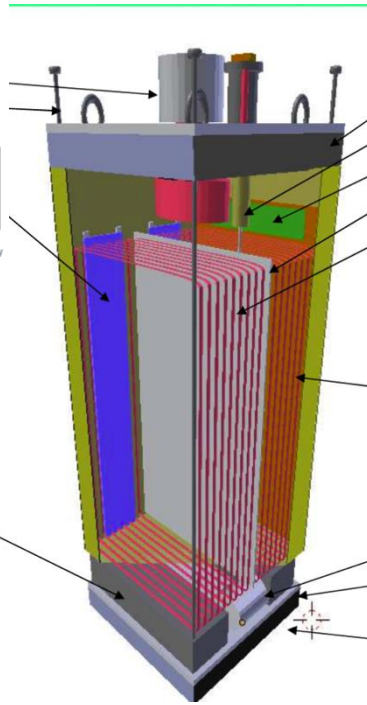
- Large scalable cryogenics plant
- New scalable and hierarchical control system
- large trigger DAQ system

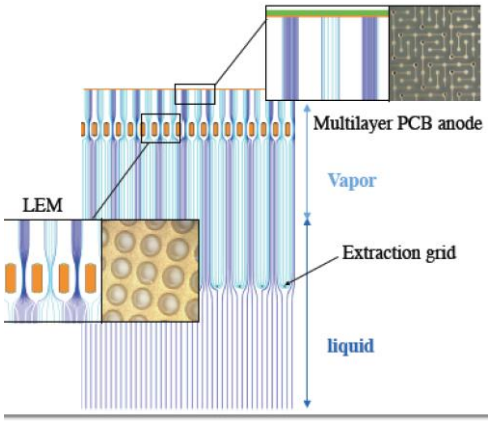
And we support new ideas and new detector R&D

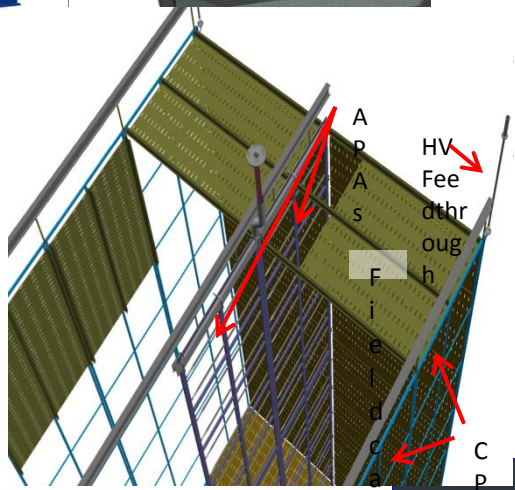


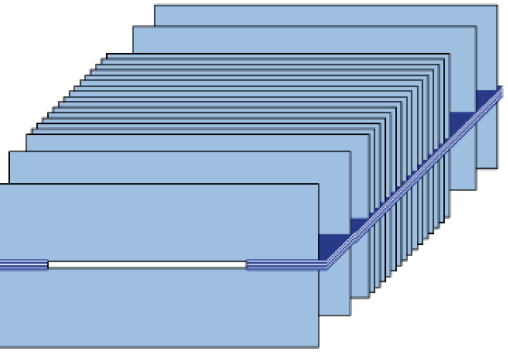


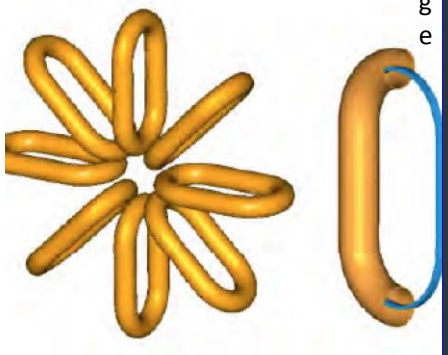


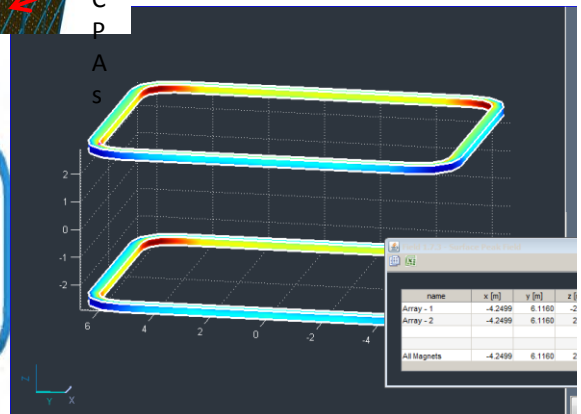


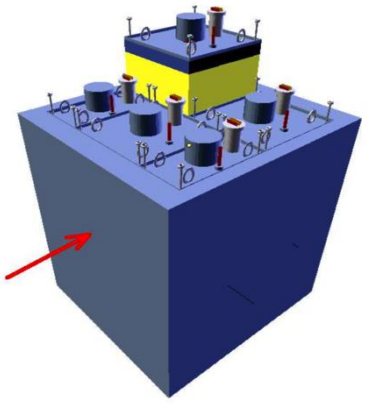




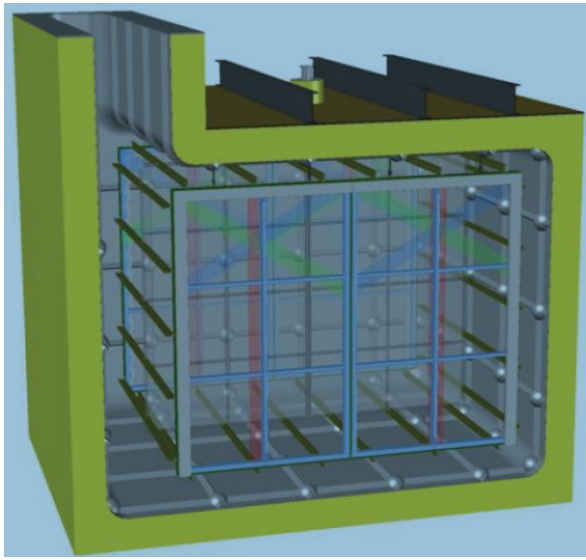


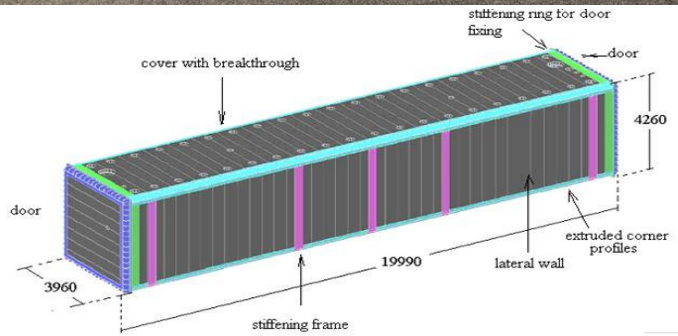


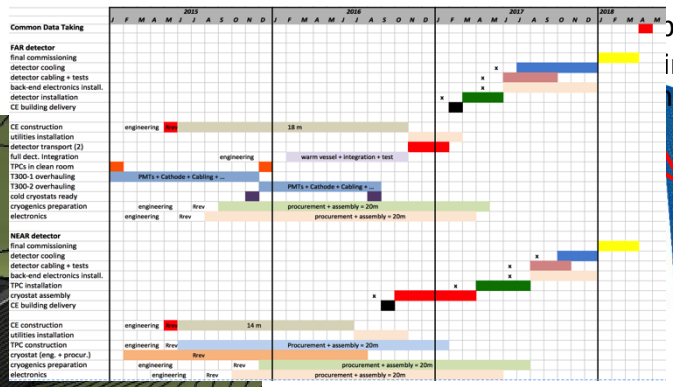


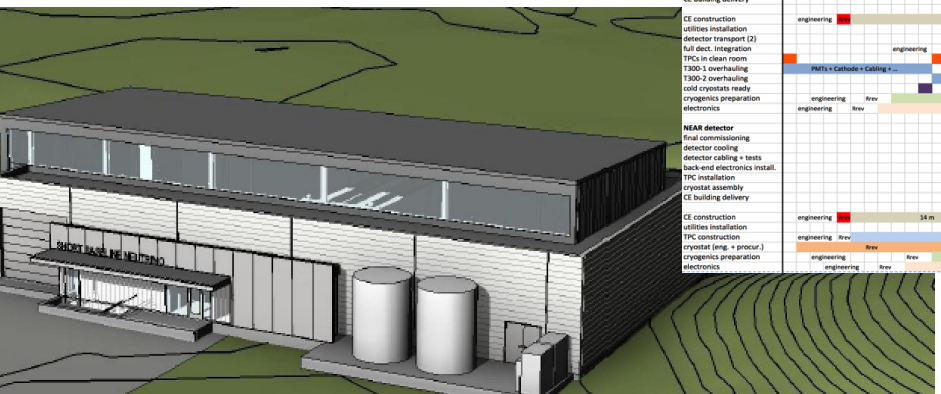


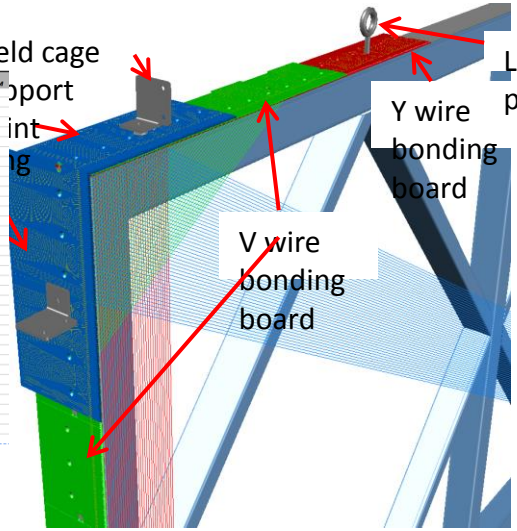
And we support the FNAL short baseline











What we are not …..

- ✓ ***Your bank***
- ✓ ***A self service***
- ✓ ***A chaotic Organization***

BUT

- SPSC monitor and starting process
- MOU pre-defined relation
- Engineering and physics partners
- Results oriented

On the medium-long term we could imagine to:

- ✓ *Actively participate in the construction of the first 10kt detector and/ or the second one if the EU groups request so, using CERN infrastructure and contractual capabilities*

- ✓ *Participate in the LBNF infrastructure design and implementation, in particular in the cryostats and cryogenics activities*

- ✓ *Participate in the design and construction of components for the neutrino new beam line*

On the medium-long term we could imagine to:

- ✓ *Actively participate in th*
  first 10kt detect
  the FI

The Conditions are:

- an emerging well-agreed and undisputed European approach to LBNF by the community
- with a formal request to CERN to move in this direction
- a sound LBNF and ELBNF project organization which will allow an effective and timely contribution

- ✓ *...onstruction of*
  c... ...utrino new beam line