

Preparing the DarkSide-20k UAr cryogenics system move to LNGS from CERN

One more system test in Q1 2022 at CERN, then ready to move.

Work to be performed before DarkSide-20k installation at LNGS:

1. Complete Radon trap installation
2. Complete particulate filter installation

For TPC Mockup Using the cryogenic system (see slide 3)

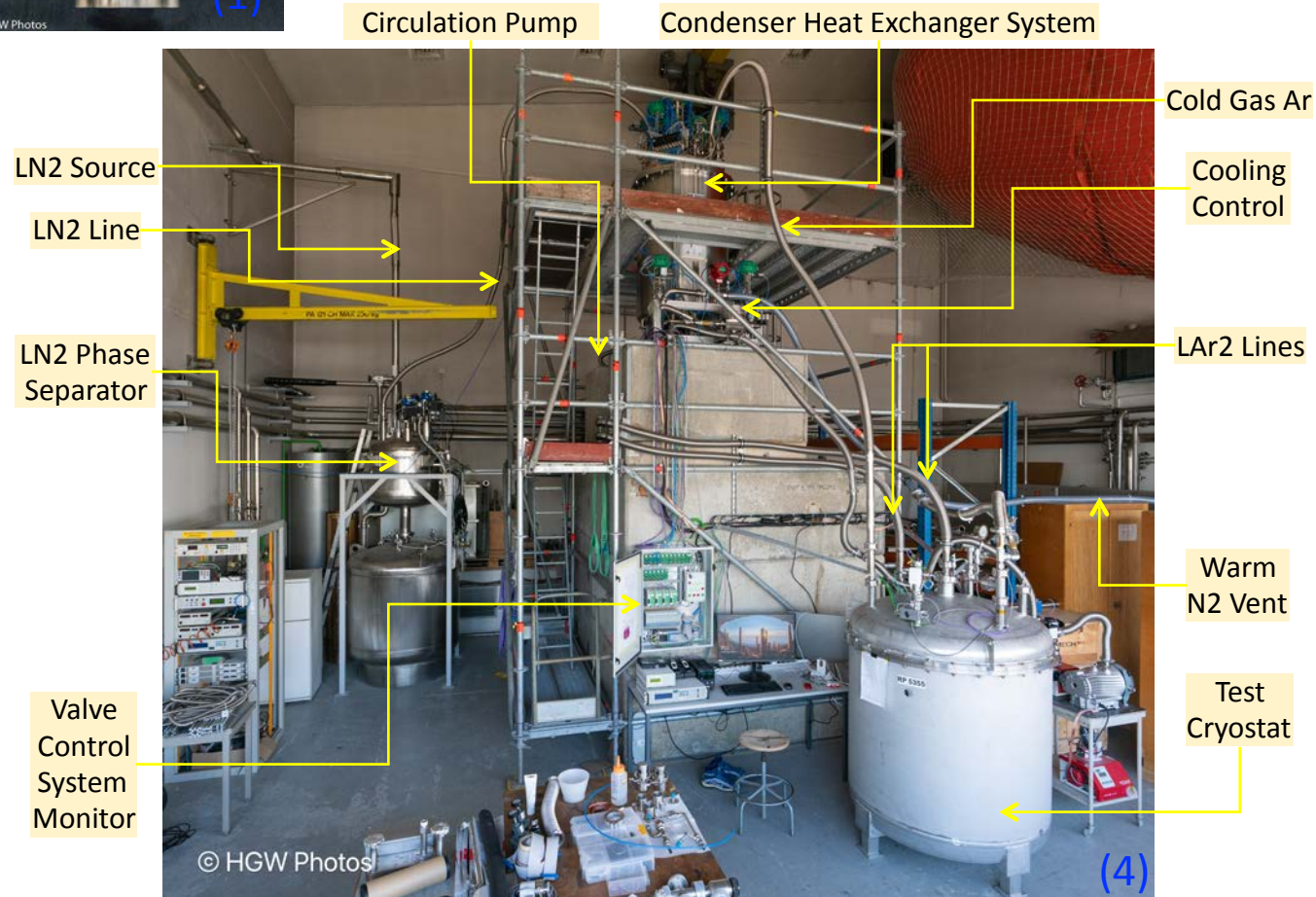
1. Required floor space at LNGS (A foot print of **3.5m x 2.5m and a height of 5m**)
2. ideally at current DS50 platform so no new infrastructure required.
3. Need a lower level for the 1-ton cryostat (suggest to use DS10 area)

We suggest to perform the TPC mockup assembly in CR2 (Part of NOA facility) to rehearse full DarkSide-20k TPC assembly

DarkSide-20k Underground Argon Cryogenics System

Will be confirmed at CERN before moving to LNGS

- 1, DarkSide unique condenser design
- 2, In house fabrication of the gas handling system
- 3, Fully instrumented condenser system
- 4, Fully integrated, installed and tested at CERN

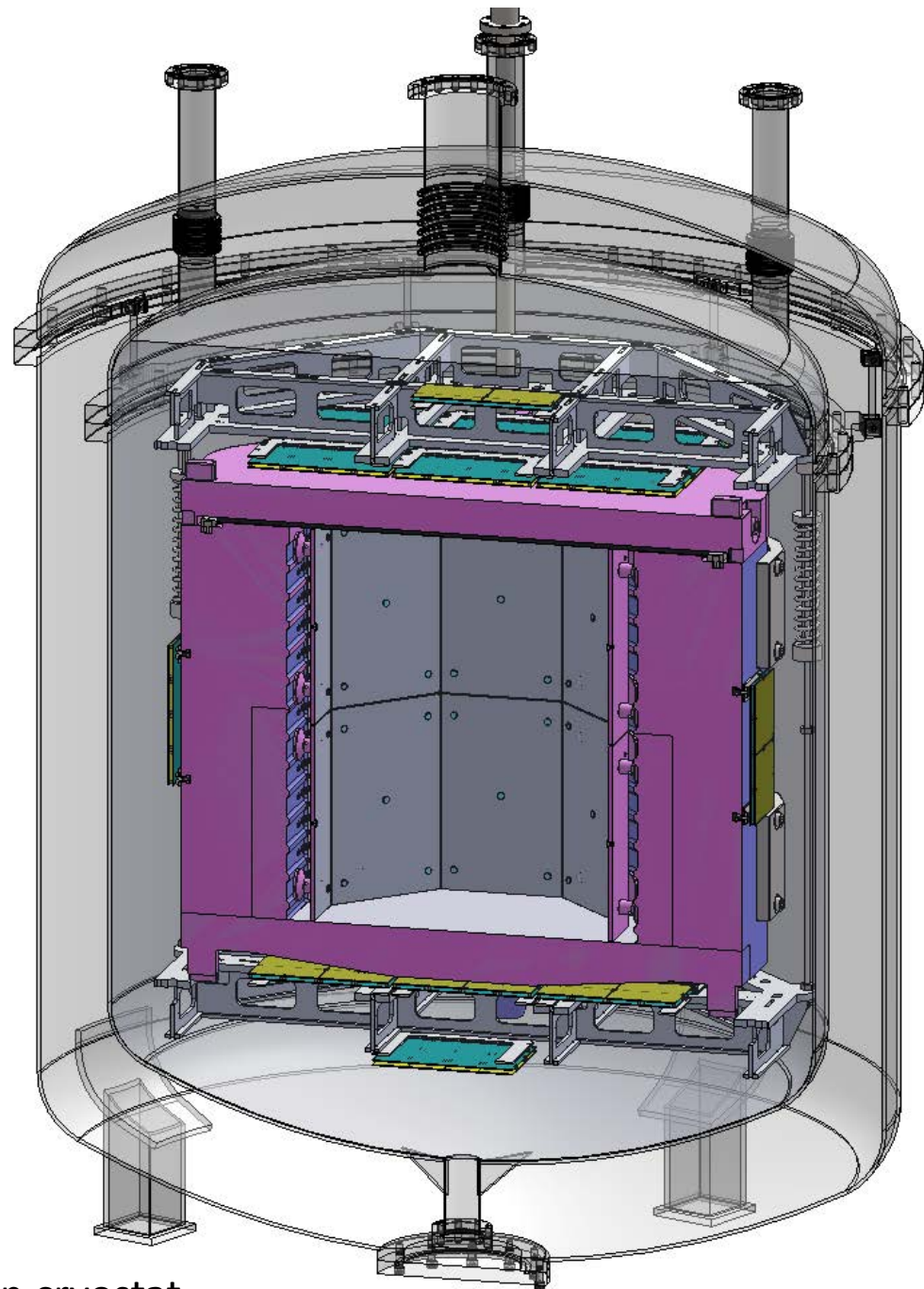


****At LNGS, to add Radon trap and particulate filter****

DarekSide-20k TPC Mockup

To be performed at LNGS

1. Test all TPC mechanical design concepts
2. Confirm detector leveling scheme
3. Thermal managements
4. Gas pocket formation (power requirement)
5. Gas pocket thickness control
6. Confirm HHV details
7. Confirm PDU – TPC interfacing
8. Confirm PDU installation procedure
9. Confirm vPDU installation procedure
10. Assembly procedure and dust control
11. Field cage system and mechanics
12. Cathode and HHV installation details
13. TPC sandwich concept confirmation
14. S2 gain and setting confirmation
15. UAr internal loop design confirmation

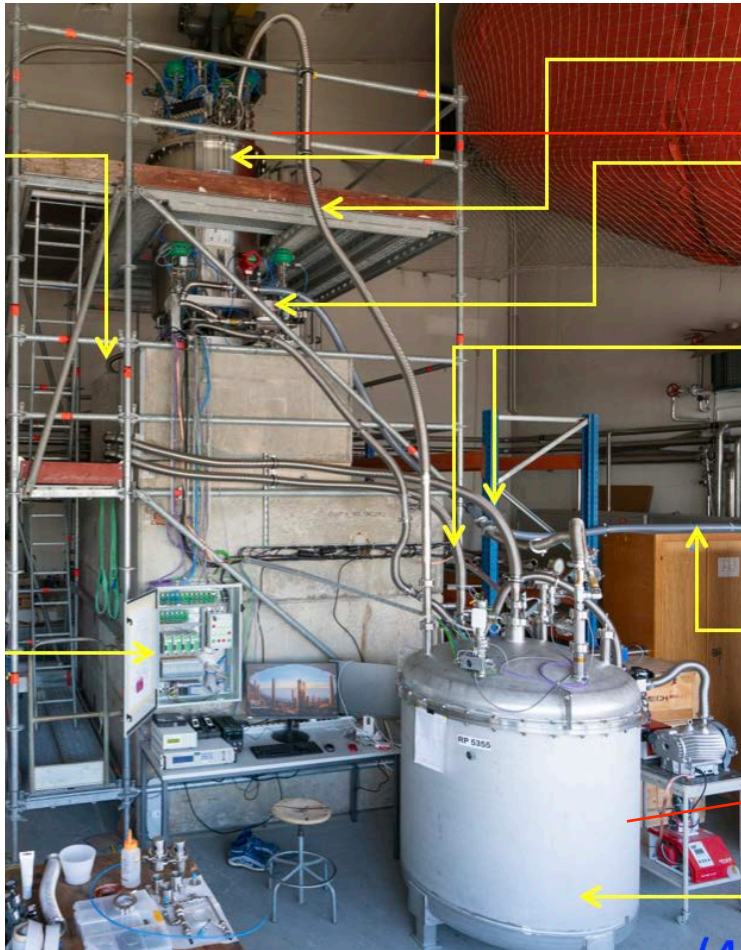


One ton cryostat

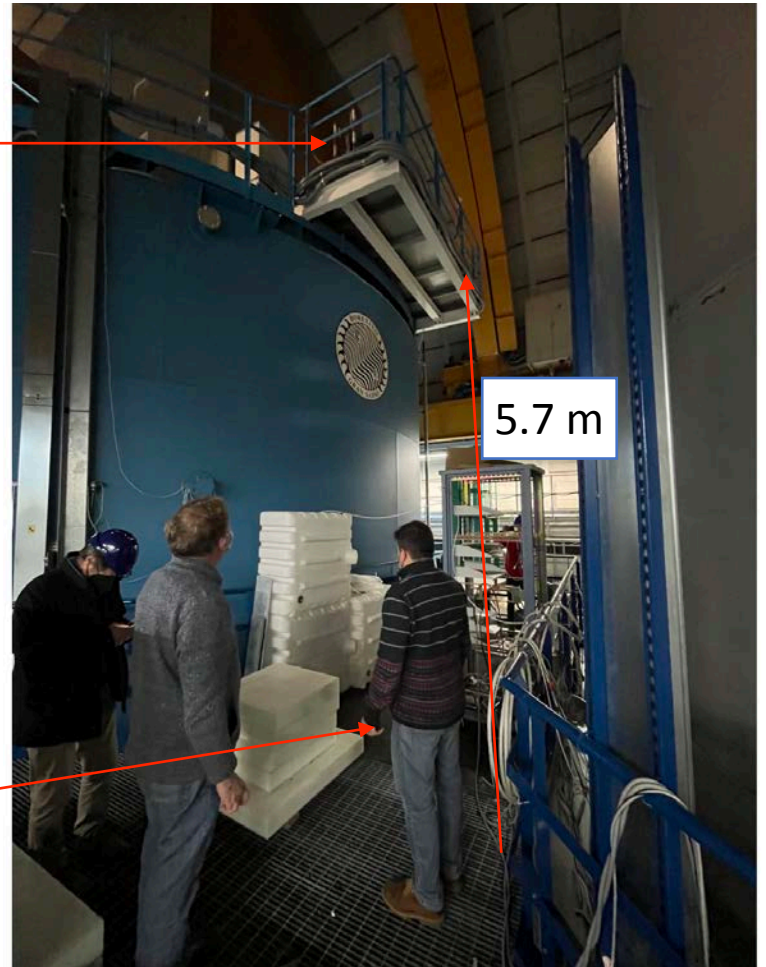
Major Items to arrive at LNGS

1. The Condenser system
2. The one ton cryostat
3. A separate crate with gas system control and transfer lines
4. A separate crate with instrumentations.
5. A separate crate with tools.

These could be done with a standard land truck load



now at cern



in the DS50 area

office space at LNGS (not included the darkside Coll. request)

From April 2022: 5 offices

eng/integration office : 2 rooms for 3-4 persons

schedule officer + underground manager : 1 room for 2 persons

cryogenics : 1 room for 2 persons

project management : 1 room for 2 persons

From summer 2022 : 1 office

CERN visitors :1 room for 1-3 persons

