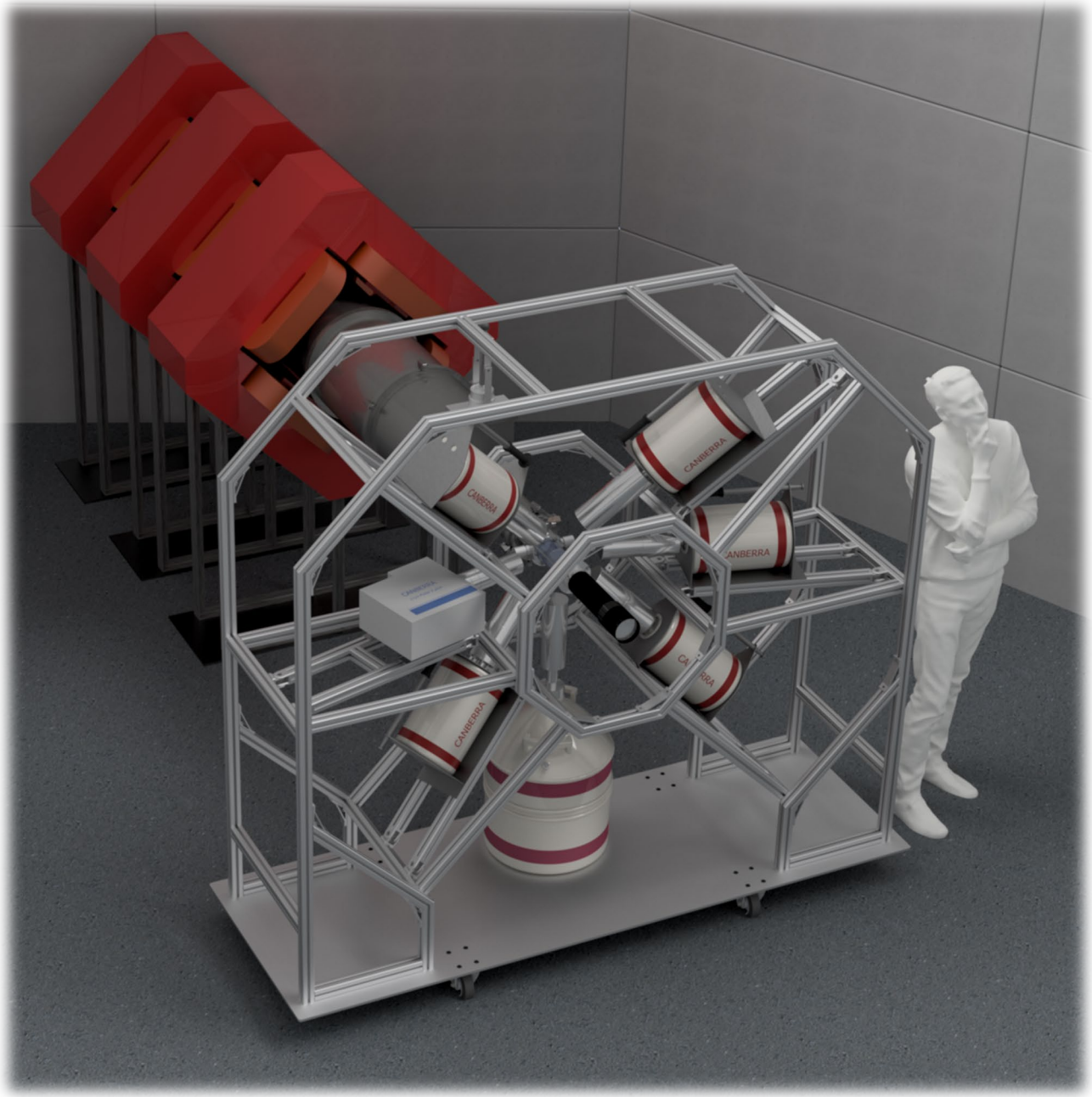


Hardware for OMC4DBD

OMC4DBD General Collaboration Meeting,
19-20 April 2021

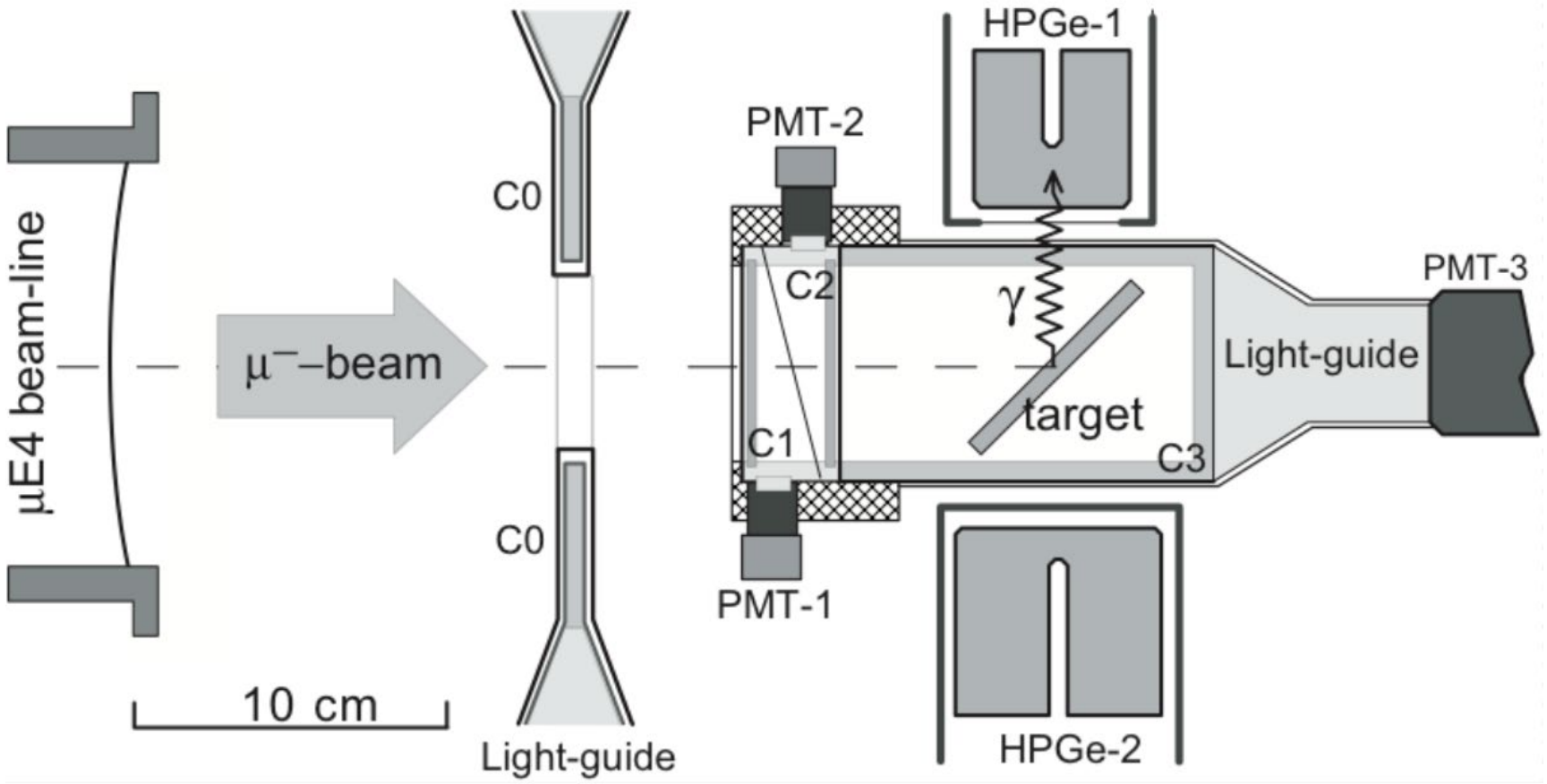
EGOR SHEVCHIK

9/04/2021

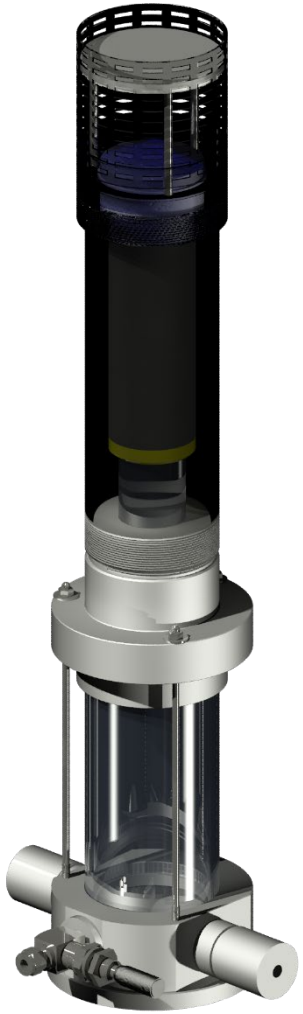
Tasks overview

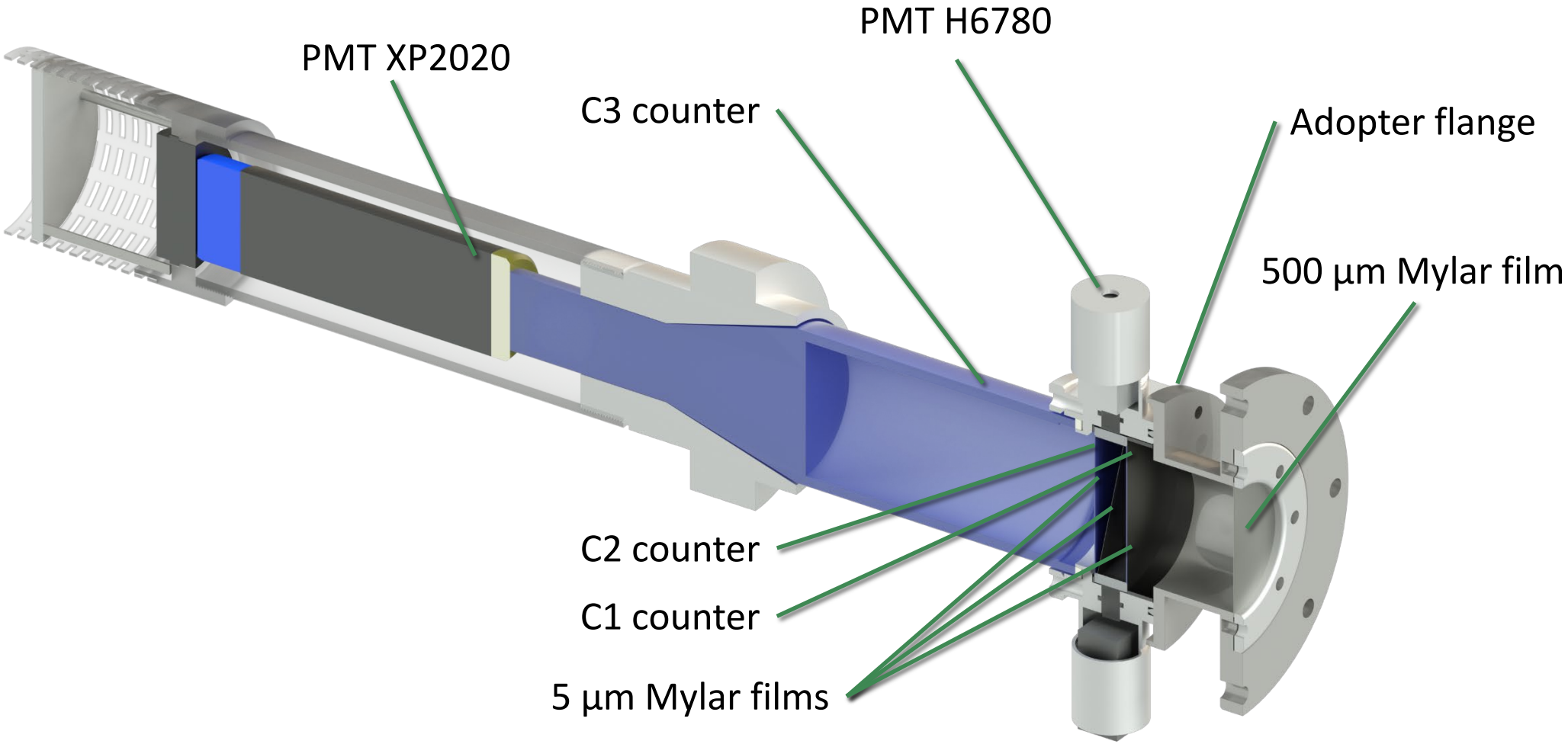
1. OMC targets for 2021-2023 are solid state only. It was decided to implement gaseous state target design with several improvements.
2. There is no more Miniball from ISOLDA in PSI. We have to create our own setup of germanium detectors. Liquid nitrogen auto-filling system is still available and should be implemented for the setup.
3. One would like to use existing trolley for line movement of the setup
4. In order to rationalize beam tuning procedure we obliged to use additional stack of electronics. There is also another DAQ branch from LAMA (Mario Schwarz talk)

Target setup (“old-school”)

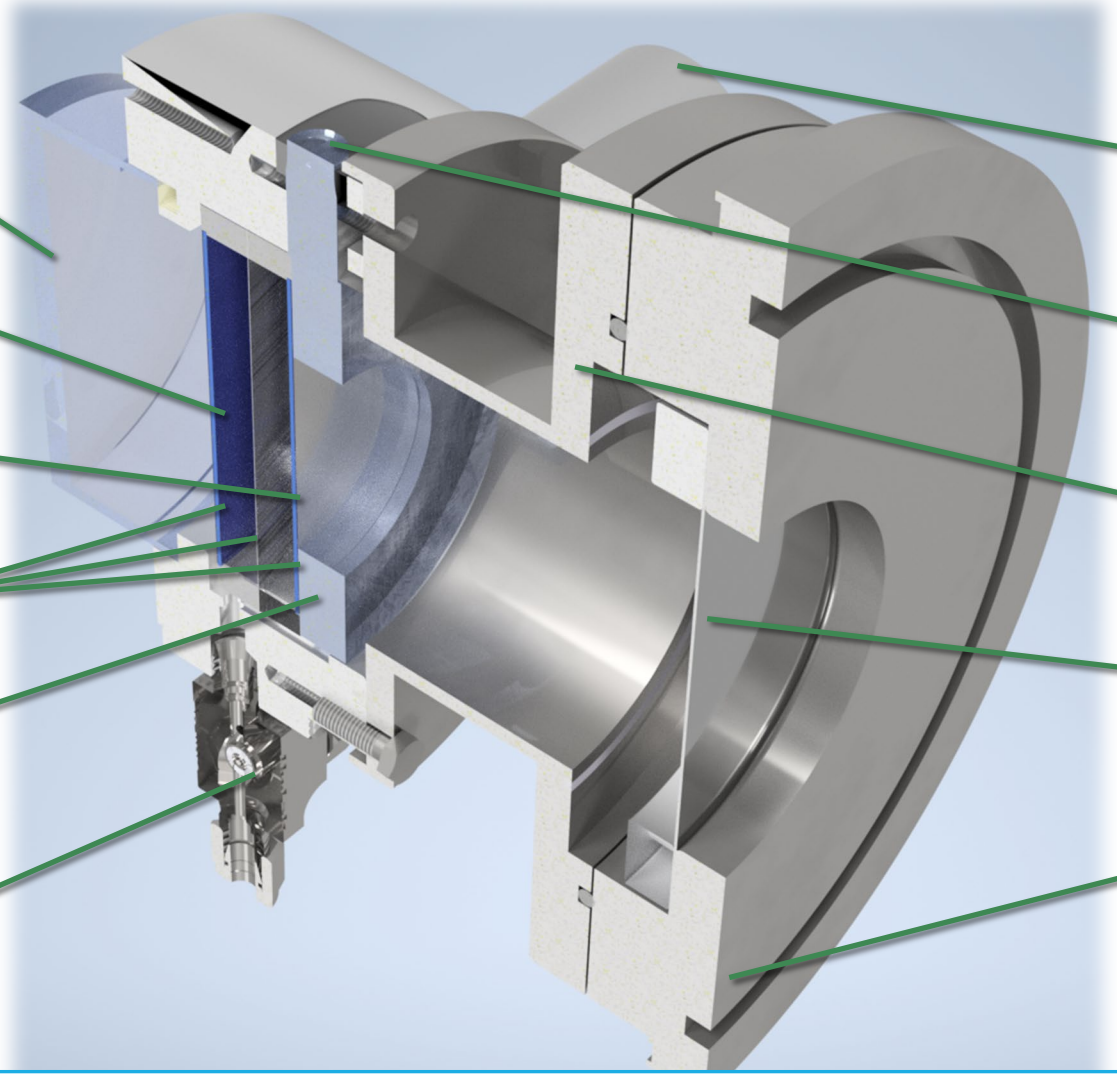


Target setup (“old-school”)





Target setup (“new-age”)



All parts are available, tests are ongoing (mainly by Sergei Kazartsev)

Target setup equipment

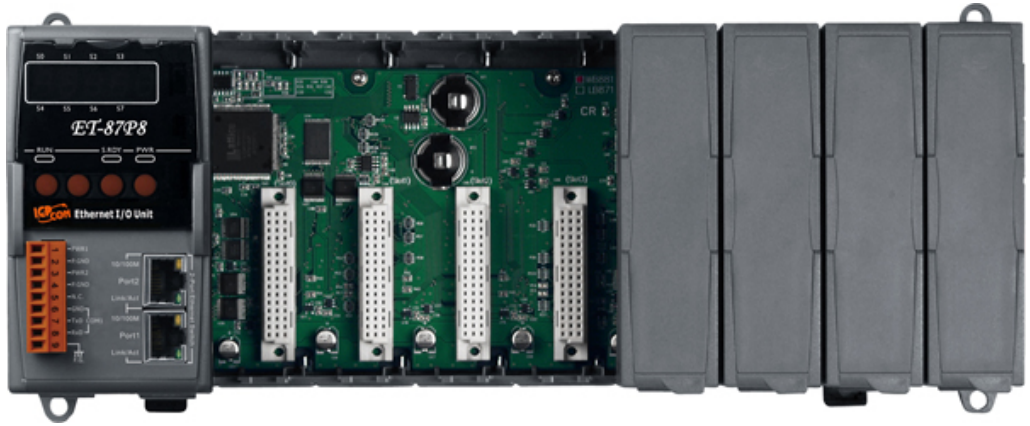
C0 counter
H10720 x2
Built-in HV power supply
0.5 – 1.1 VDC adjustable

C1, C2 counters
H6780
Built-in HV power supply
0.5 – 1.1 VDC adjustable

?

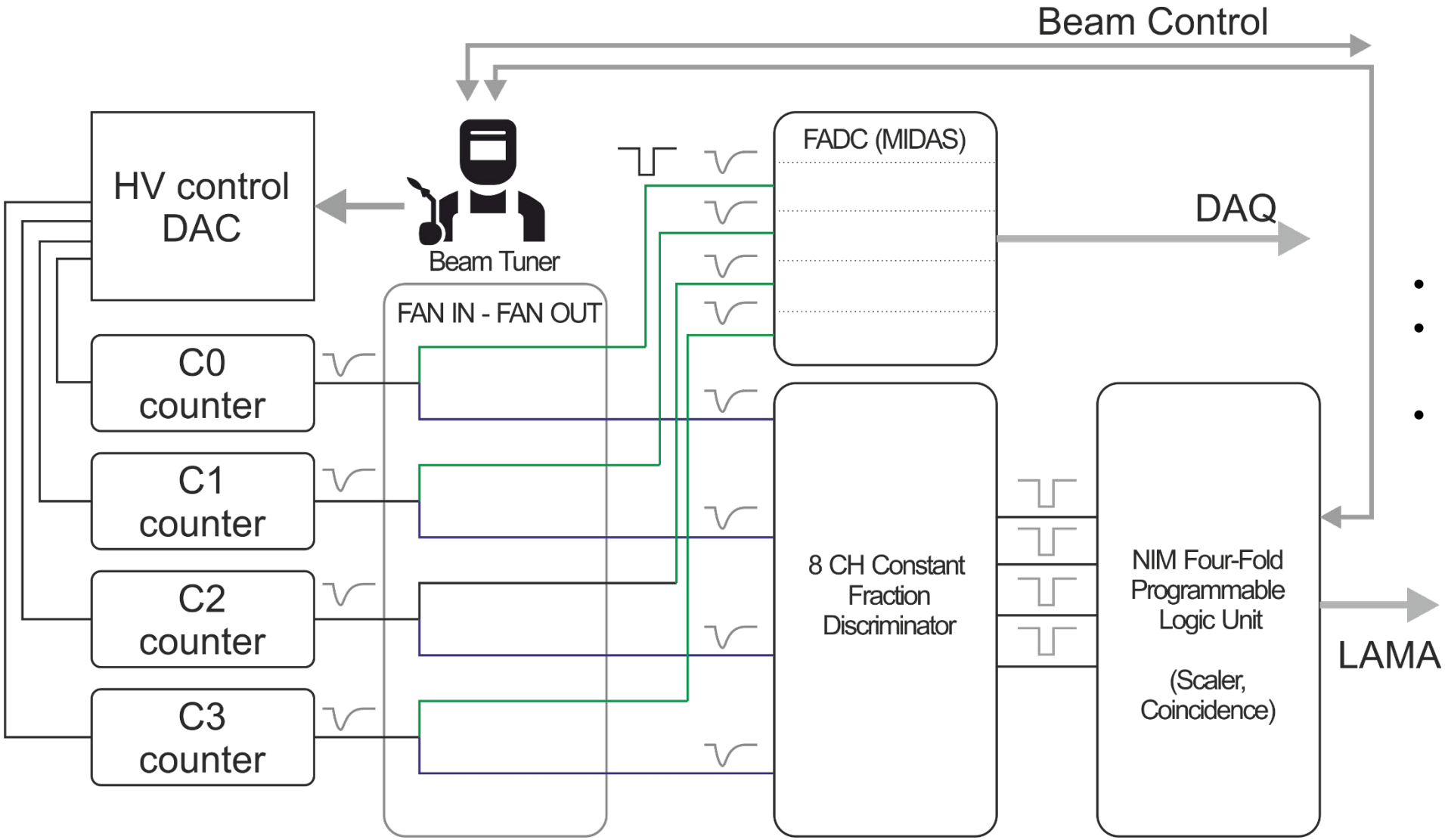
C3 Counter
3” PMT in stock
With Traco DC-DC for HV
0-4 VDC adjustable

Remote control with
ICPDAS ET-878P



ICPDAS DAC **I-87028UW-G**

Beam tuning



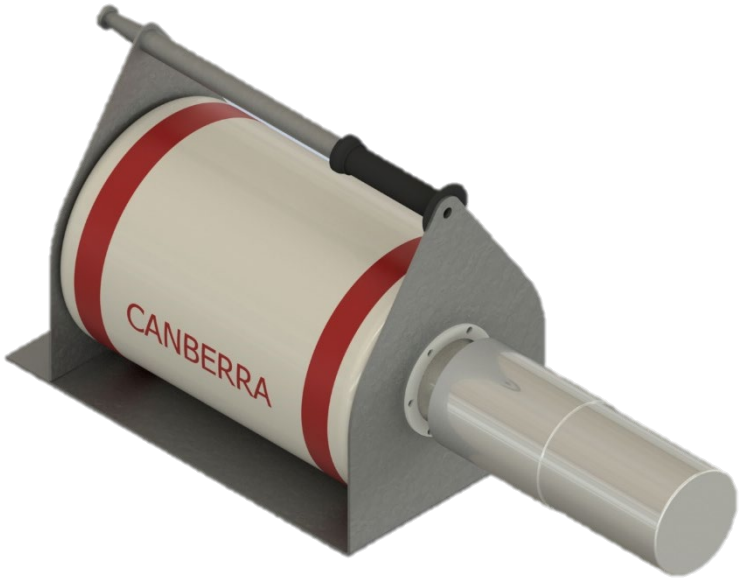
$\overline{C0}\&C1\&C2\&\overline{C3}$

Optimal conditions:

- Minimize C0 and C3
- Maximize C1 and C2
- Minimize muonic X-rays from oxygen and carbon

Ge-detectors setup

x6



BigMac cryostat

x1

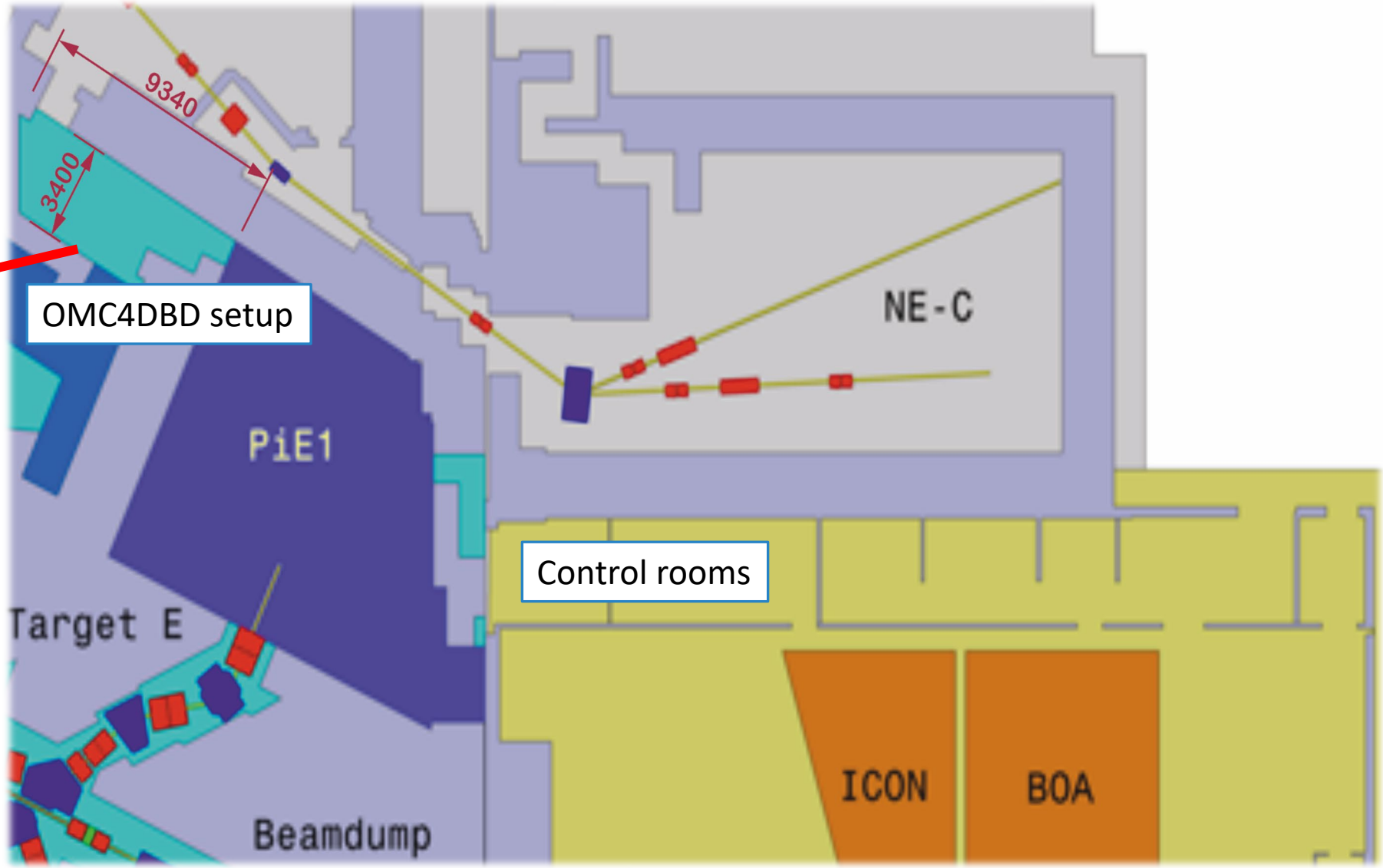
CryoPulse 5
(Electrically Refrigerated Cryostat)

x1

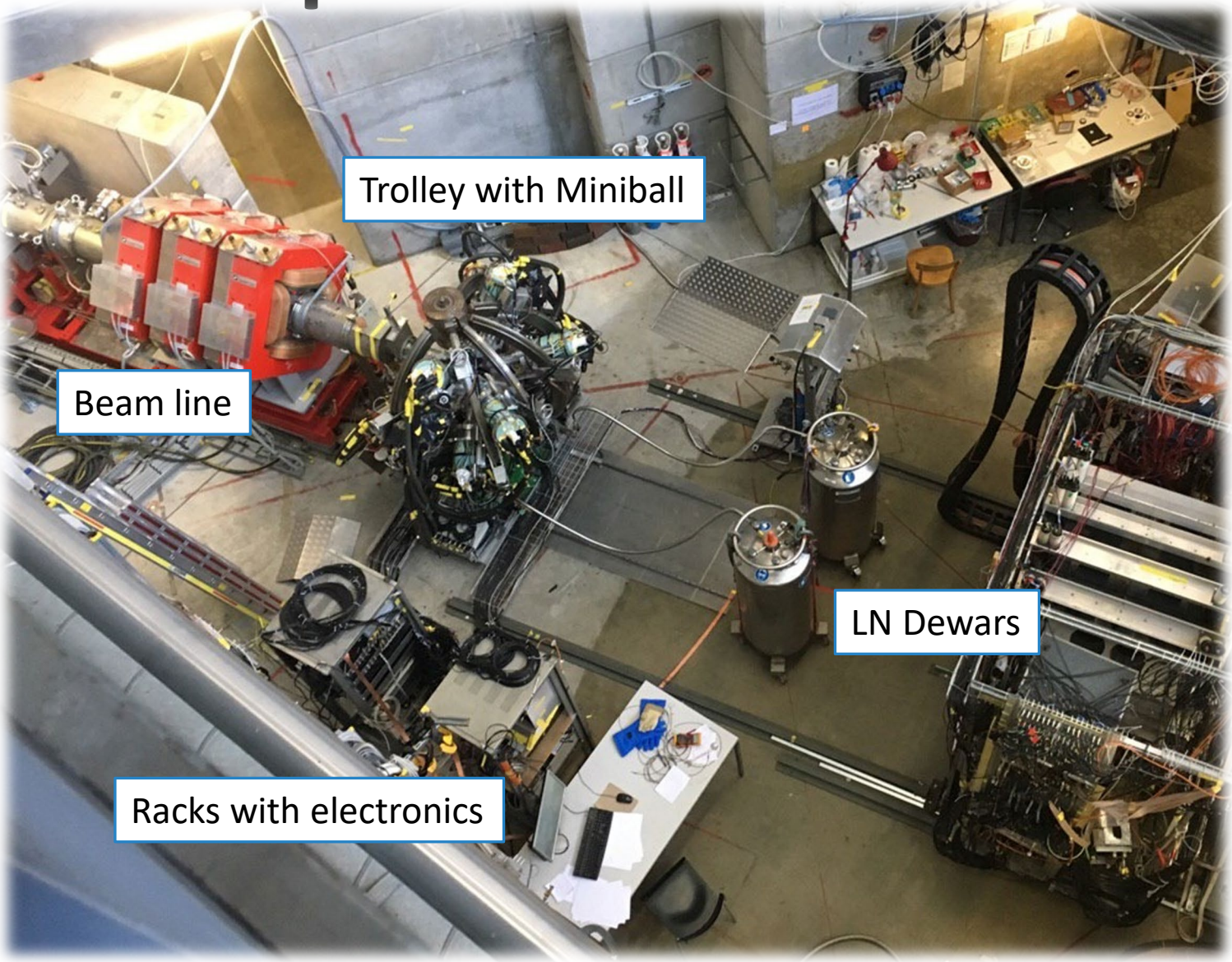
Vertical Dipstick cryostat

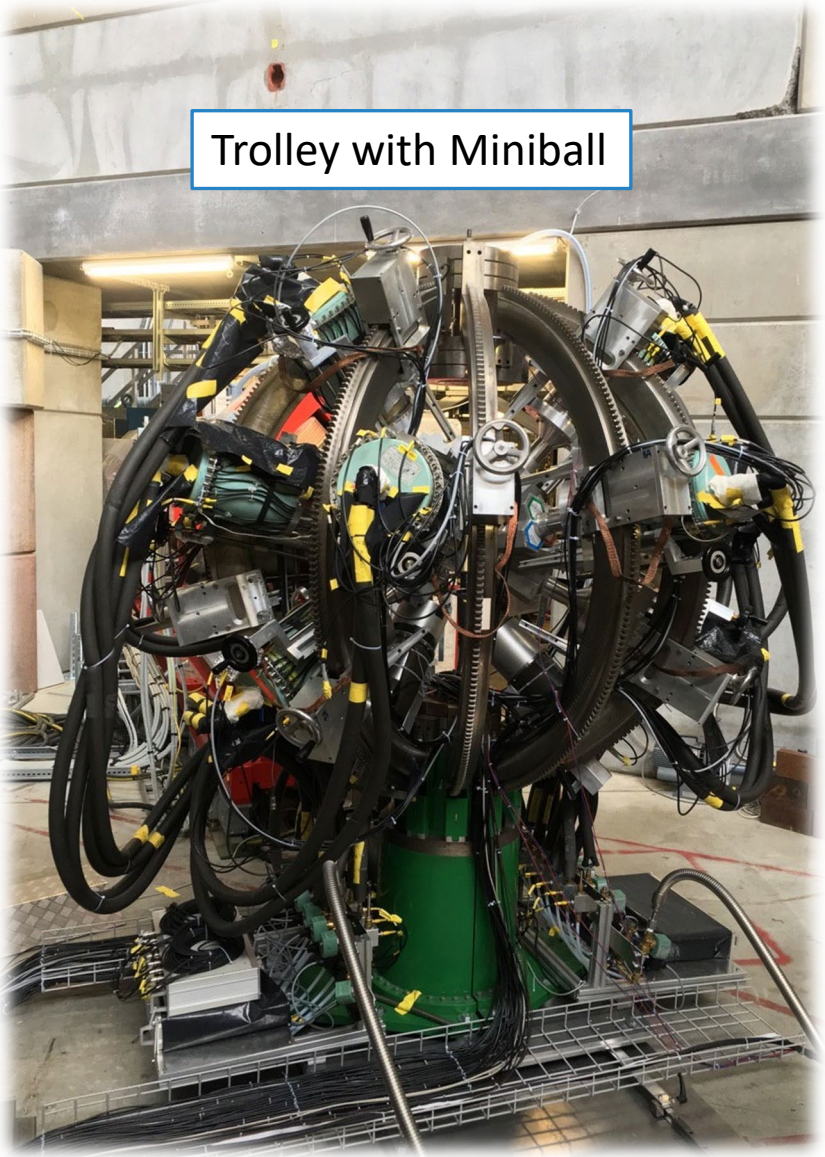
Konstantin Gusev & Elizabeth Mondragon talks

Experimental hall

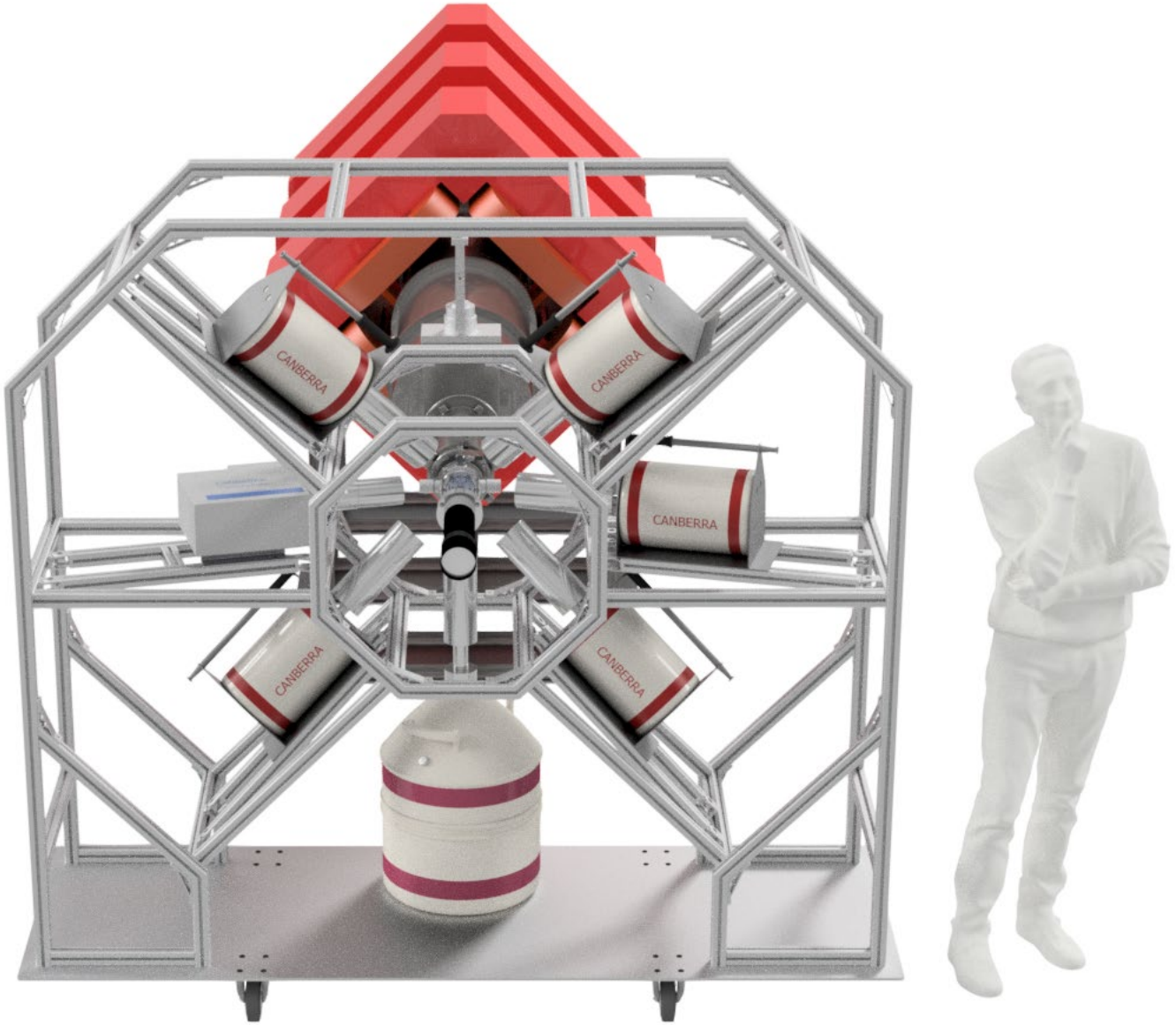


Experimental hall

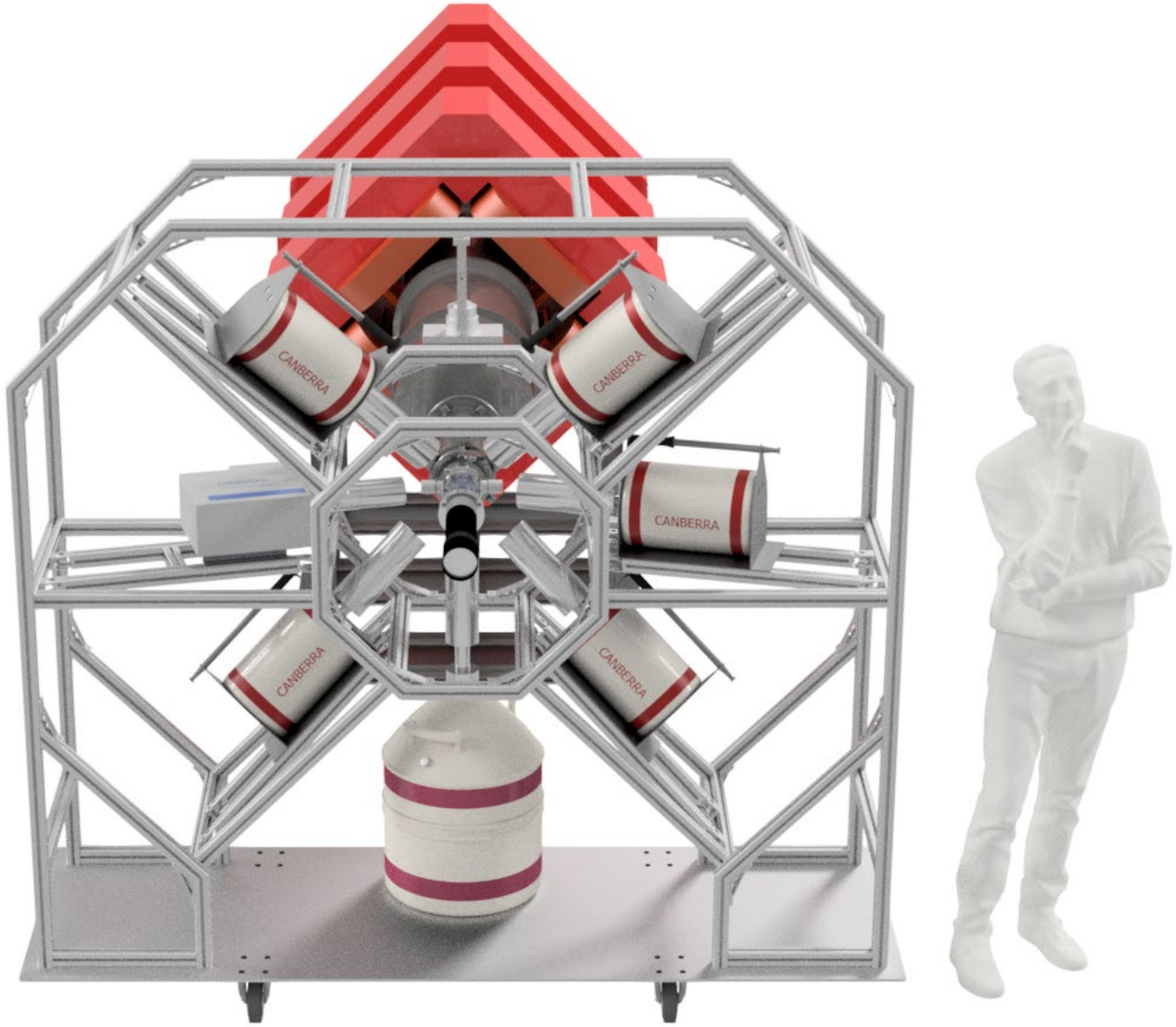




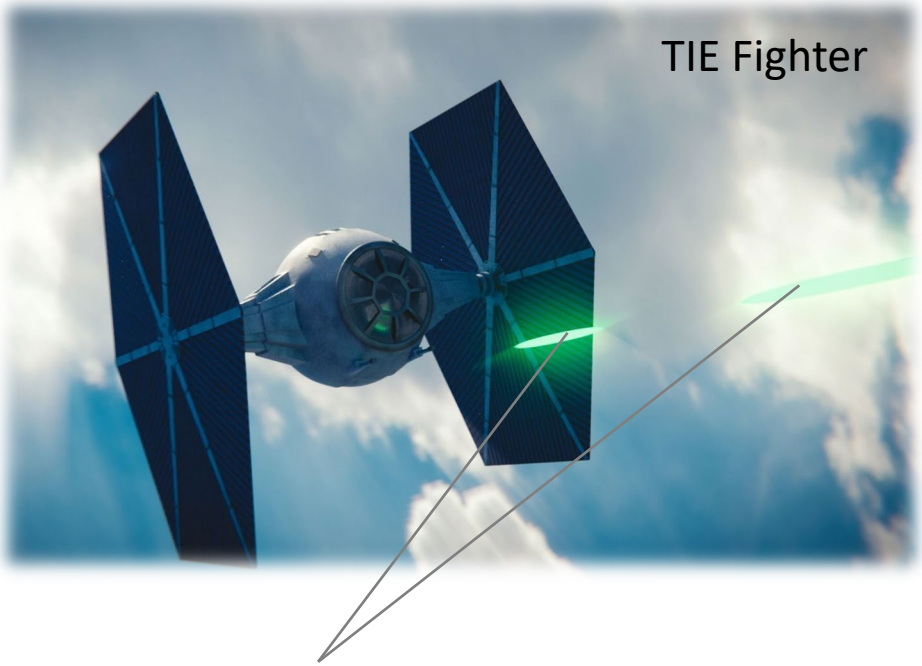
Ge-detectors setup



Ge-detectors setup

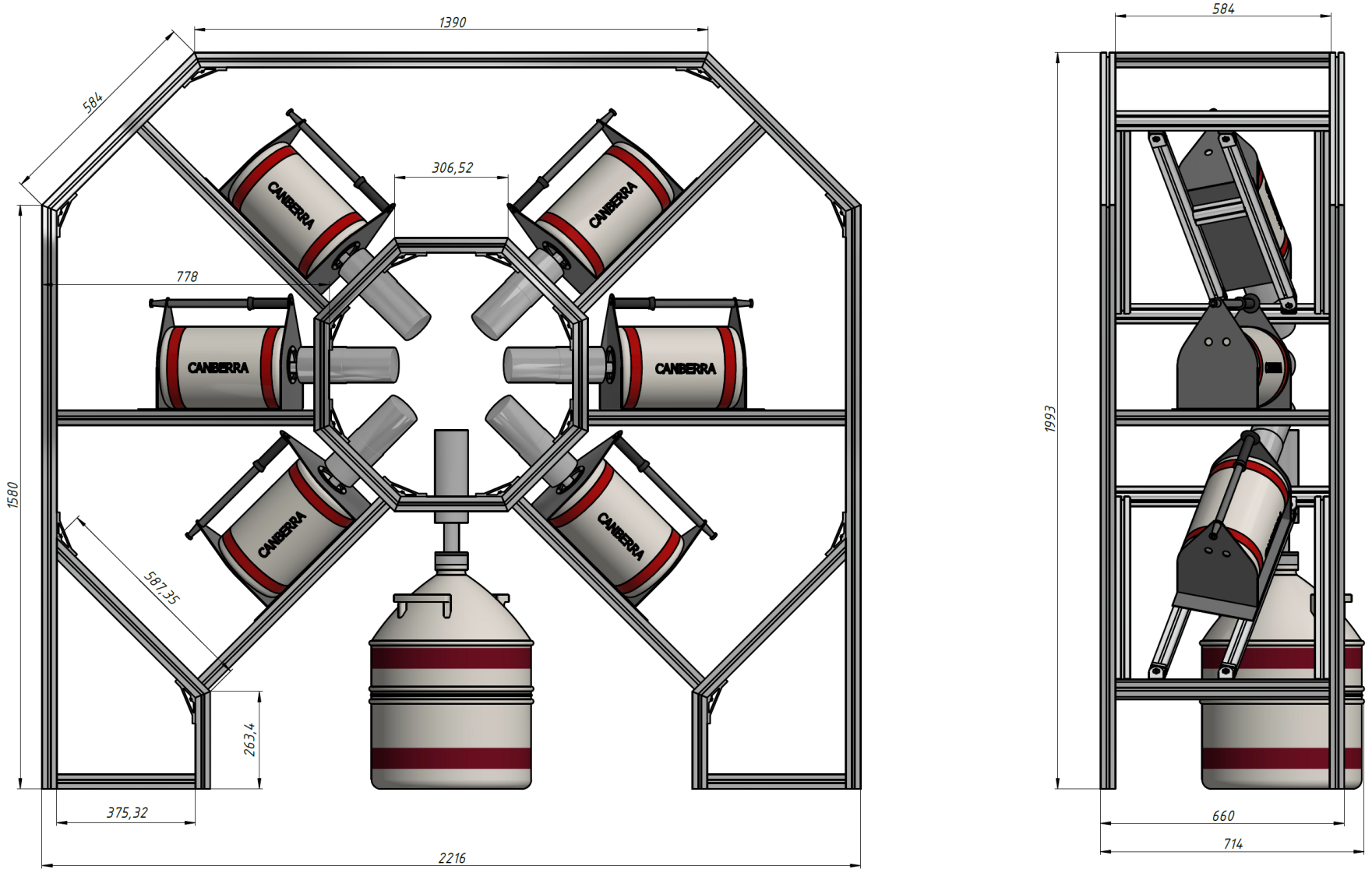


A LONG
TIME AGO
IN A GALAXY FAR,
FAR AWAY...

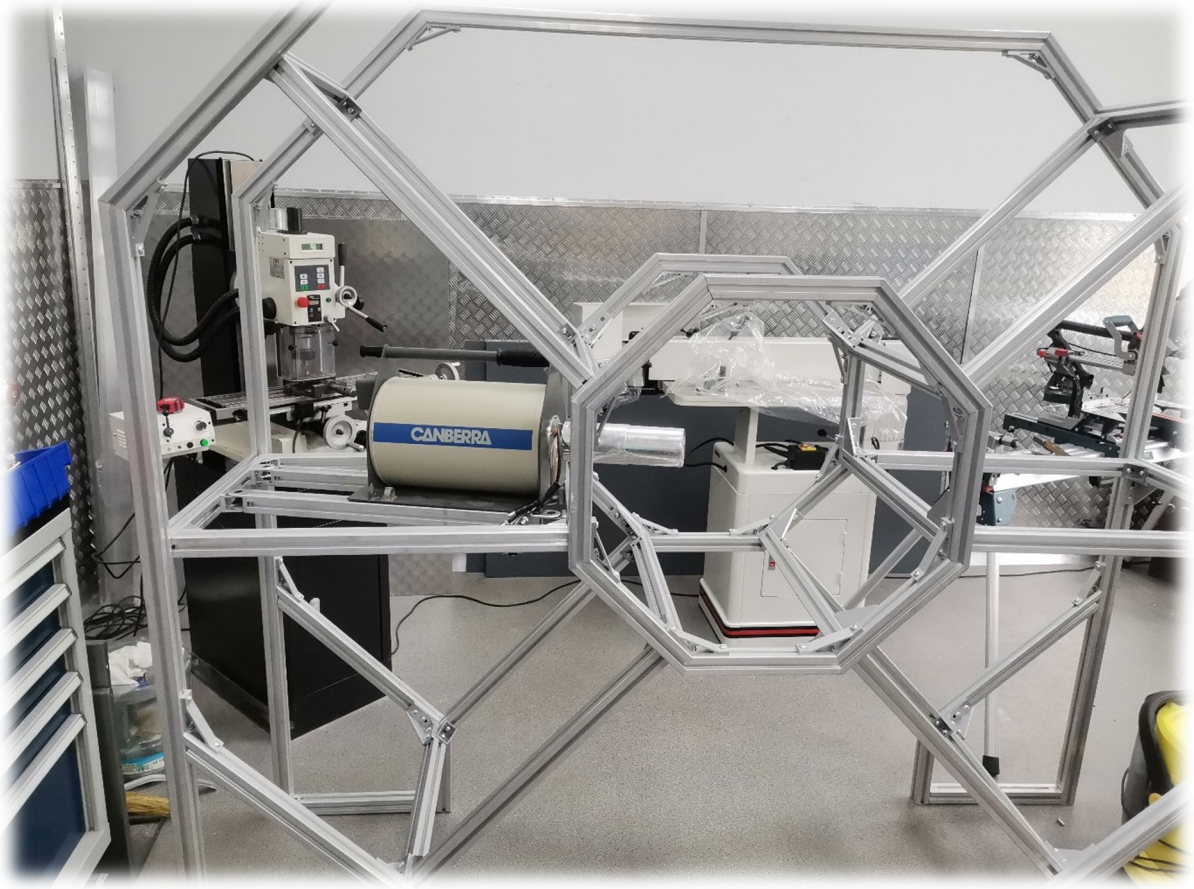


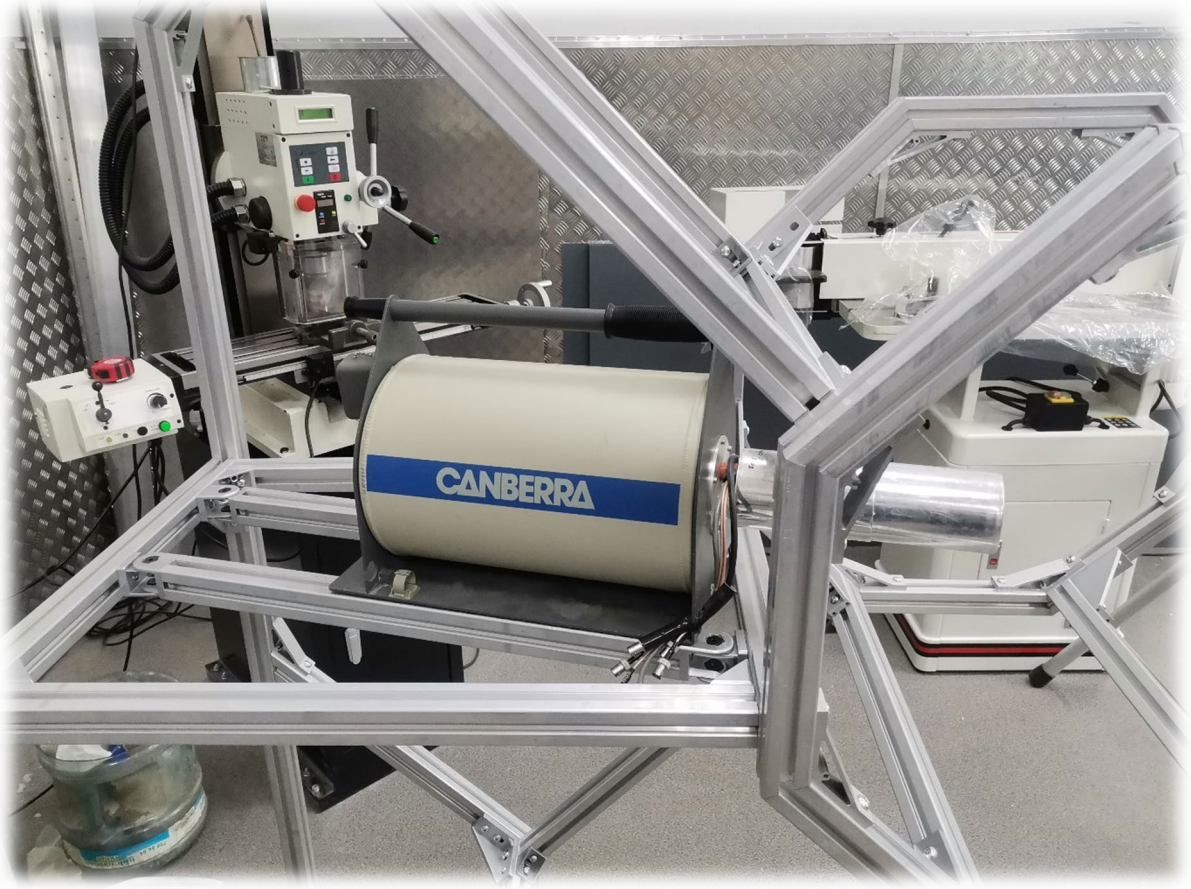
Thanks to
Christoph Wiesinger,
Konstantin Gusev,
George Lucas

Ge-detectors setup dimensions



Ge-detectors setup





First assembly of the frame at the end of March (some parts are missed)

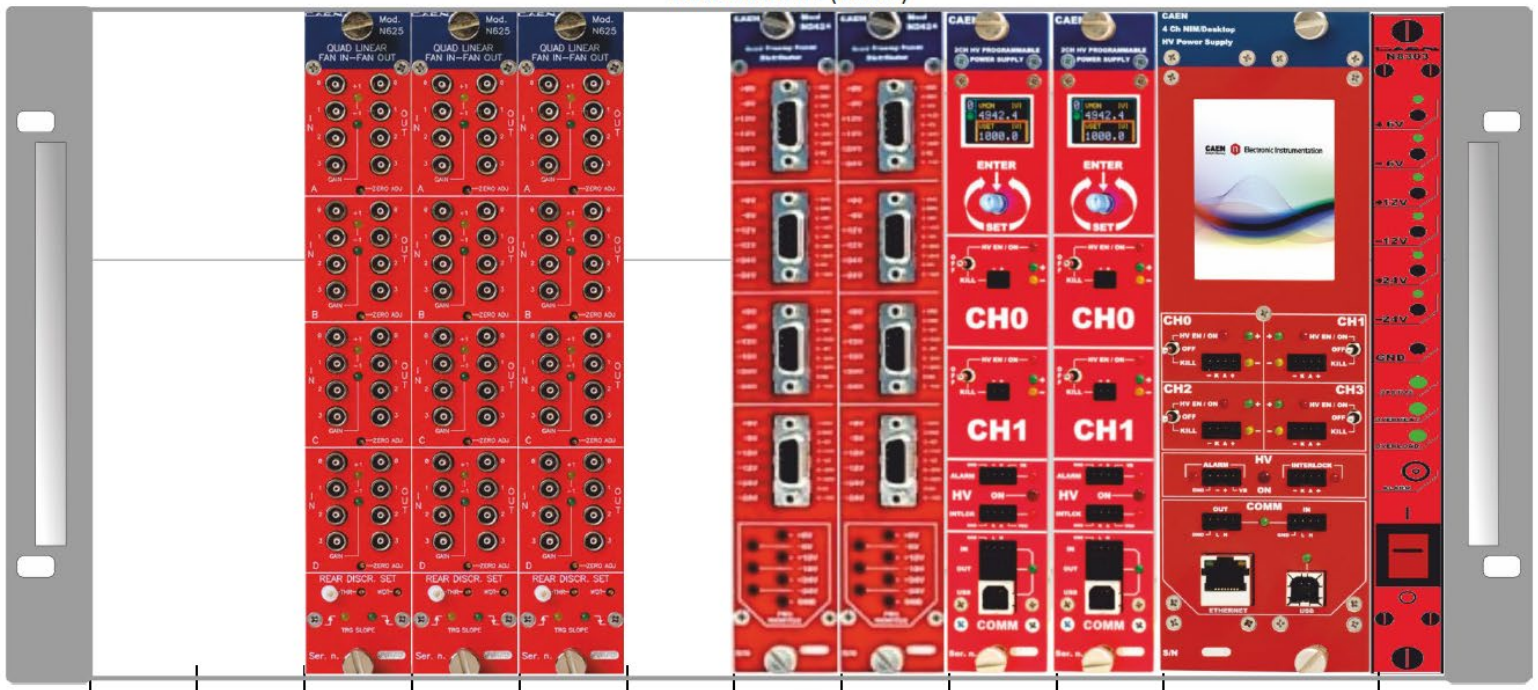
Ge-detectors setup

Holders for the BicMac cryostat made of stainless steel with necessary holes.

7 pcs will be ordered in next 2 weeks, may be delivered with other equipment for the full assembly test in TUM.

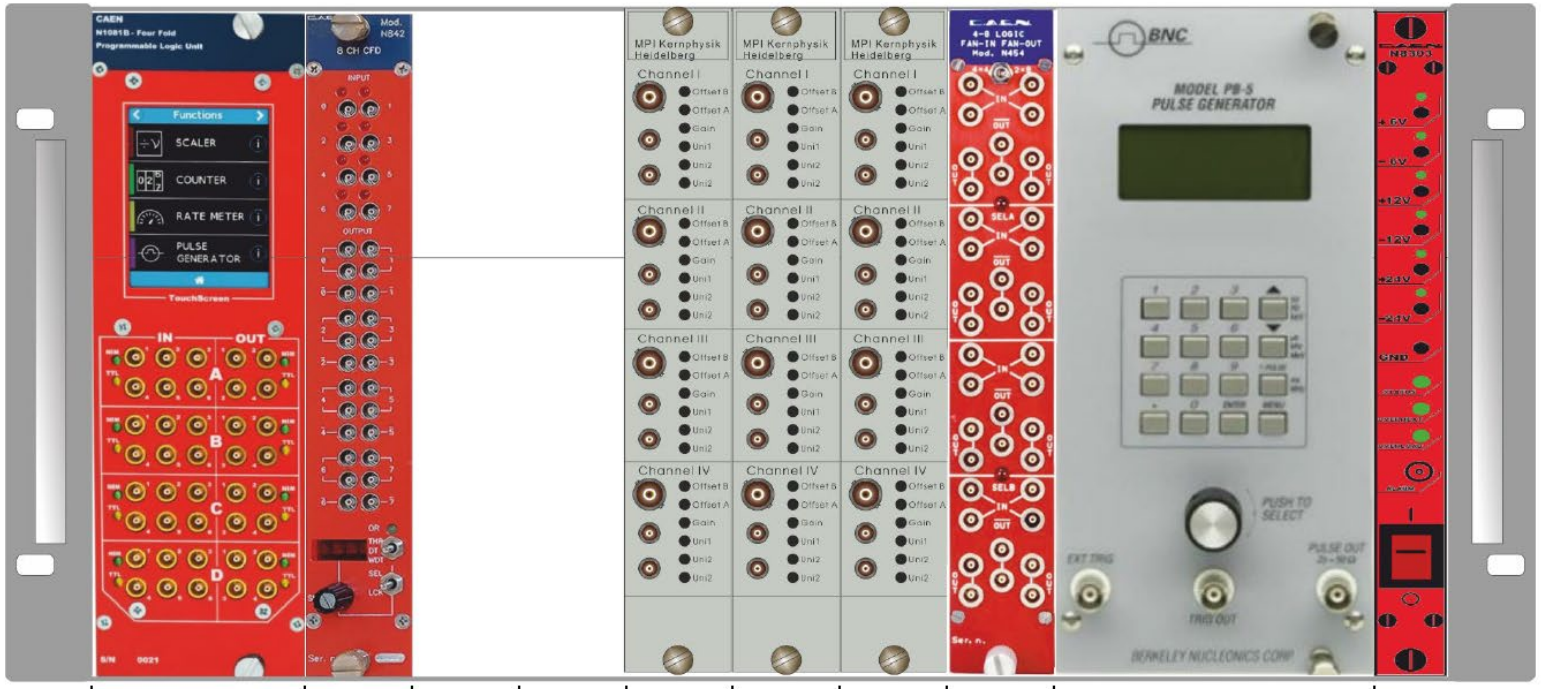
NIM electronics

NIM CRATE #1 (300W)



Name	N625	N625	N625	N5424	N5424	N1471A	N1471A	NDT1471H	SUMM, mA	300W CRATE I, mA
+6V (mA)	230	230	230	20	20	10	10	10	760	17000
-6V (mA)	225	225	225	20	20	10	10	10	745	17000
+12V (mA)	110	110	110	25	25	620	620	850	2470	3400
-12V (mA)	155	155	155	25	25	530	530	850	2425	3400
+24V (mA)				40	40				80	3400
-24V (mA)				40	40				80	3400

NIM electronics



Name	N1081A	N842			GS	GS	GS	N454	PB-5	SUMM, mA	300W CRATE I, mA
+6V (mA)		500						350		850	17000
-6V (mA)		1800						350		2150	17000
+12V (mA)	1500	40			125	125	125		450	2365	3400
-12V (mA)		30			125	125	125		5	410	3400
+24V (mA)									170	170	3400
-24V (mA)									150	150	3400

To be done

- Final test with scintillation counters. One should find a procedure for offline counters adjustment.
- The trolley platform at PSI has different dimensions with frame. Are we compelled to produce the new one? Where can we do that?
- Replace original cryostat holders with the new and check flexibility and reliability of the design.
- To be ready for transportation in TUM and PSI. The crucial point is the Germanium detectors, we need proper package.
- NIM crates to be ordered by TUM group (Elizabeth Mondragon, Stefan Schönert) in 2 weeks.
- Integration of LN auto refilling system into the frame. Is there enough free space?

Conclusion

I. The target setup is upgraded. All parts are available, first assembly was done. It's still necessary to perform several tests and set optimal parameters for the setup. Decision about the C0 hole dimension depends on the solid target size. One can produce a stack of C0s with different hole diameters (the replacement takes several minutes).

II. The aluminum frame parts was manufactured. The first assembling shows encouraging results, but some improvements are still necessary. A BigMac cryostat fits well into its place without any issues.

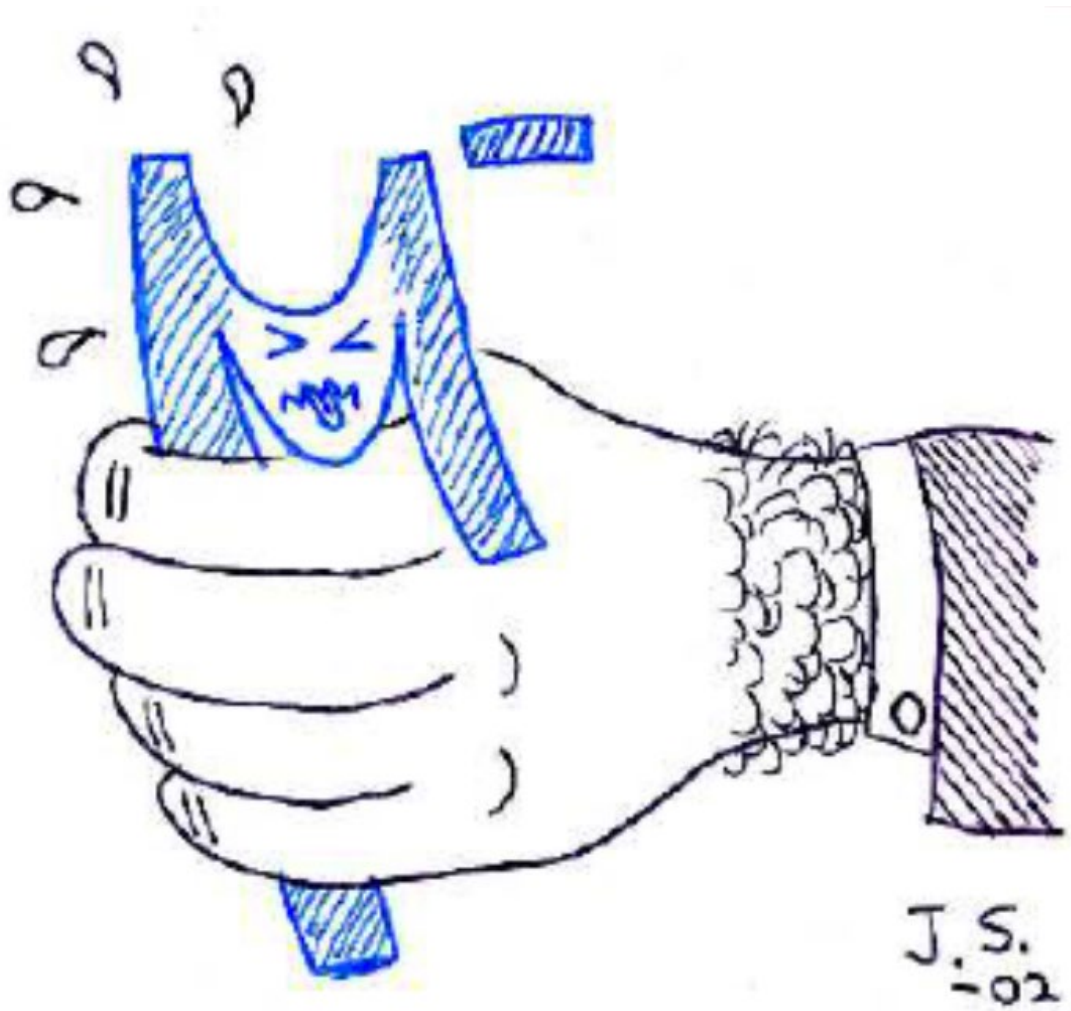
III. Cryostat holders are to be produced soon. In case of any issues we can use the original holders, but the only detector do not have it.

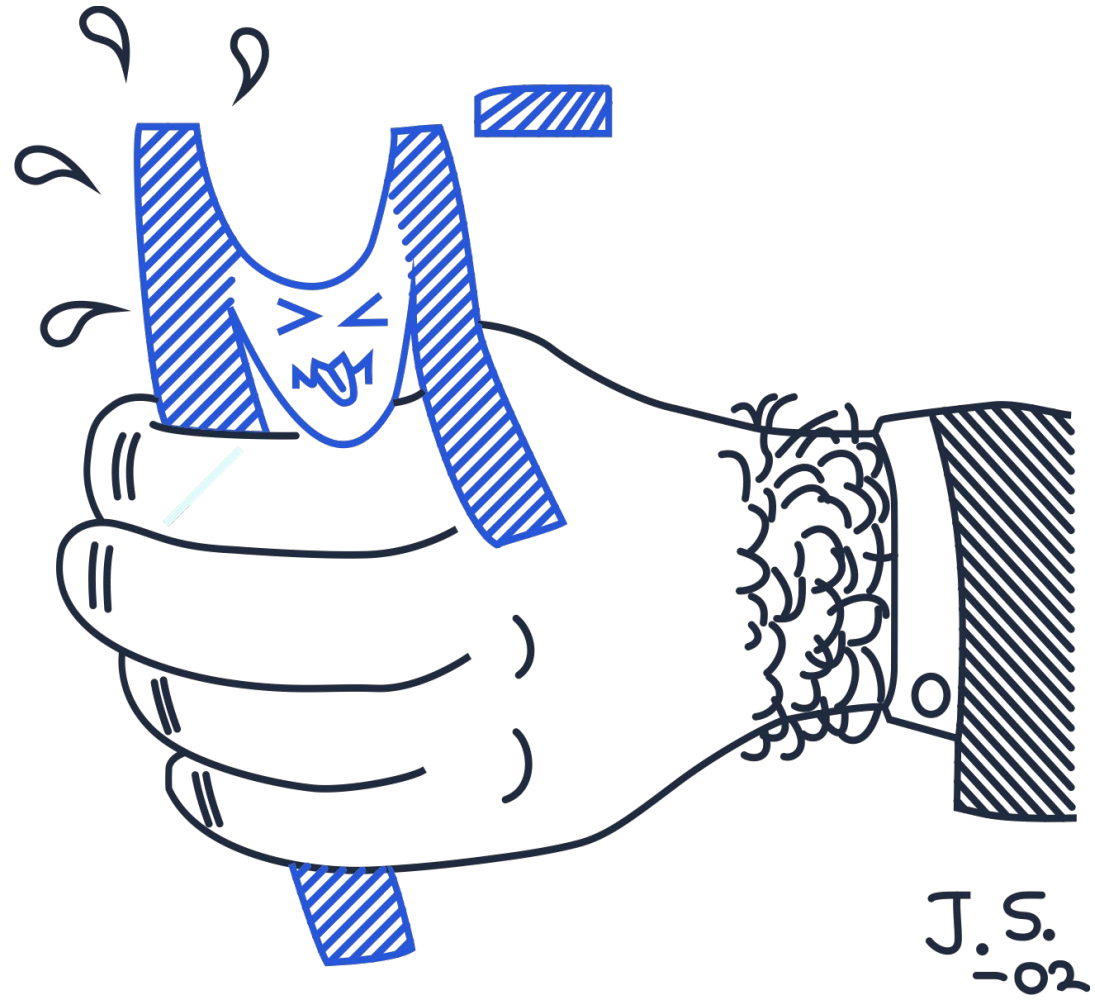
IV. All NIM electronics was found and NIM crates are seem funded. Final assembling and testing will be performed at TUM after all parts will be delivered.

V. Humanpower is necessary for rapid mounting and tuning during the first week of the beam time (Dana's talk)

Thank you for your attention!

May the Force be with you!


J.S.
-02


J.S.
-02