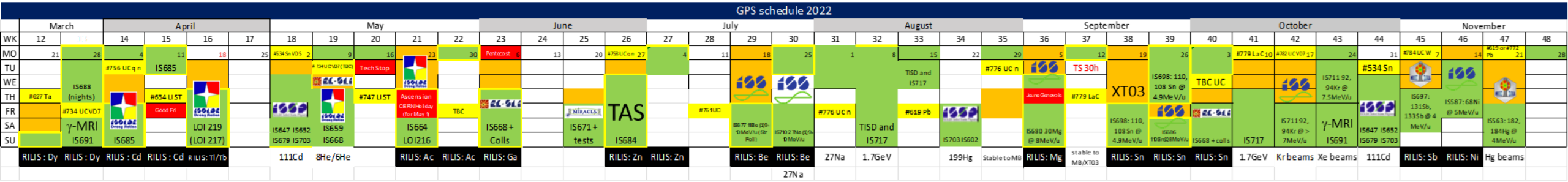
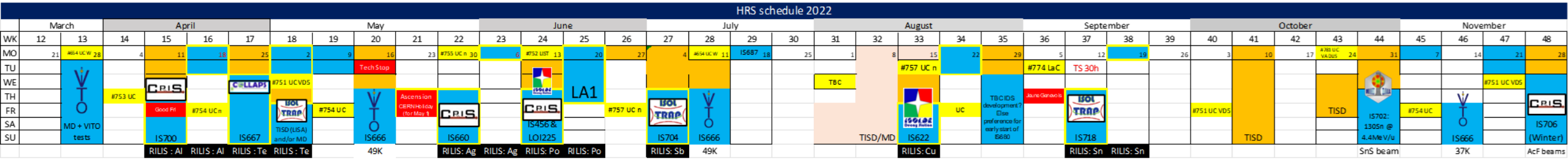
ISOLDE Coordinator report ISCC March 2023

- Summary of physics run 2022
- 2023 schedule planning
- Update on new setups
- Access/training

ISOLDE schedule 2022





Start of physics

TISD

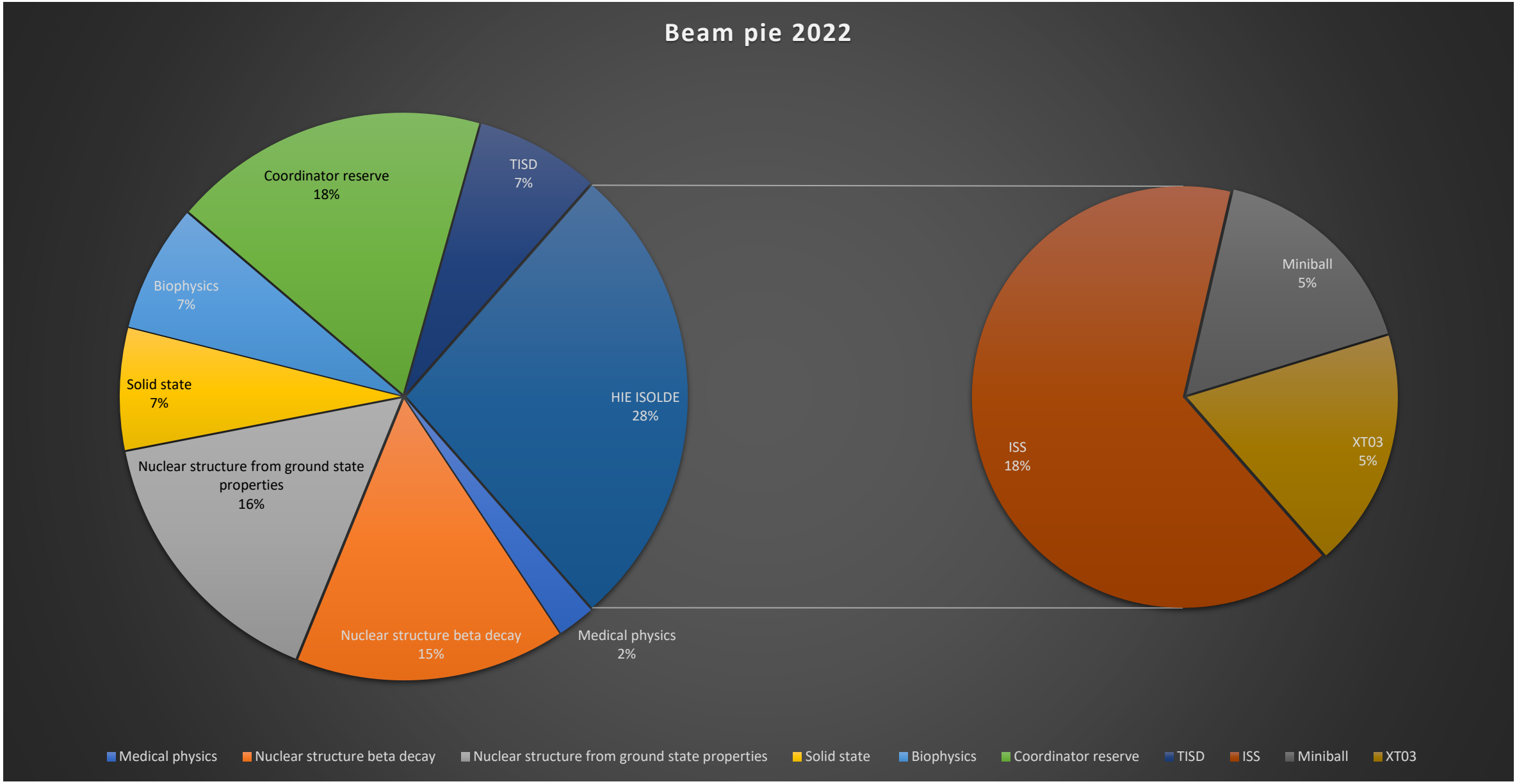
Start of HIE ISOLDE

TISD

TISD

End of protons and week of winter physics

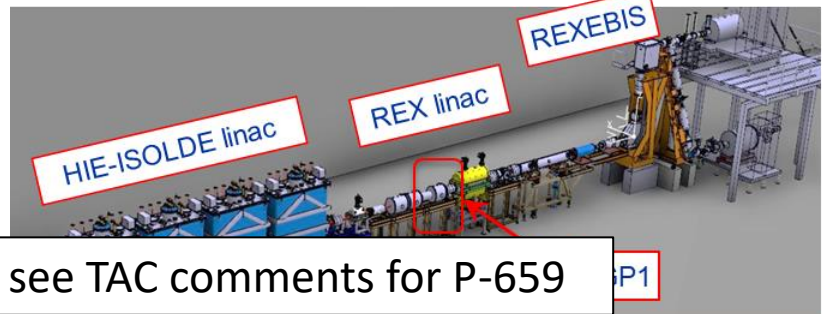
- ISOLDE started low energy experiments on 28 March as planned
- HIE ISOLDE started on 20th July
- In total 52 experiments were performed, no runs cancelled. 252.33 days available for physics (including winter).
- Delivery of protons ended on 28th November
- One week of winter physics for laser spectroscopy of long-lived radioactive molecules. Finished 5th Dec.
- New in 2022: «regular» blocks for machine development/Target development.
- 465.5 shifts delivered for physics/development. Beam was delivered to every beamline.


Beam pie 2022
Coordinator reserve
18%
TISD
7%
Biophysics
7%
Solid state
7%
HIE ISOLDE
28%
Nuclear structure from ground state properties
16%
Nuclear structure beta decay
15%
Medical physics
2%
Miniball
5%
ISS
18%
XT03
5%
Medical physics
Nuclear structure beta decay
Nuclear structure from ground state properties
Solid state
Biophysics
Coordinator reserve
TISD
ISS
Miniball
XT03

Issues encountered

HIE ISOLDE I

- Cooling in cryoplant was lost 3 times. Cavities required reconditioning delaying commissioning
- Beam commissioning was affected by instabilities in the REX accelerator. 7gap1 was especially problematic. Vibrations suspected and investigated. No cause of vibra
  disappeared in Jur



Limitations due to the 7gap are also affecting new proposals: see TAC comments for P-659

Probing the fission and radiative decay of the 235U+n system using (d,pf) and (d,pγ) reactions					
CDS#	**Proposal #**	**IS #**	**Setup**	**Shifts**	**Isotopes**
CERN-INTC-2023-019	INTC-P-659		ISS	20	235U
TAC recommendation	**The TAC notes that this proposal is compromised by the current performance of the 7gap amplifiers for post accelerated beams. A non-ideal charge state of 56+ is possible but will result in a lower efficiency and should be tested beforehand. Otherwise the proposal seems feasible.**				

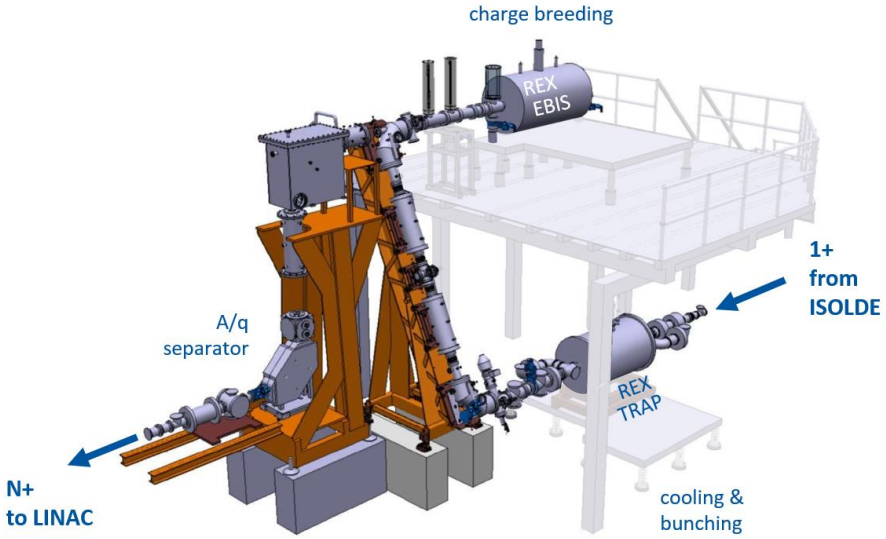
programme for HIE ISOLDE; essentially no time was available before physics.

- 7gap3 issue almost cost a physics run just before end of protons.

HIE ISOLDE II: REX EBIS

- REX EBIS solenoid experienced rapid LHe boil-off in July.
- Numerous quenches in August and magnet is now operating at 1.5T instead of nominal 2T.
- Repair of this unit is taking place in present YETS.

Fredrik Wenander IEFC 318



No physics runs lost: but we were very lucky!

RF instabilities and cryo plant went down after compressed air issue.

1st 2 HIE experiments

EBIS quenches

Main HIE ISOLDE campaign

7gap3 issue, solved on afternoon of final Friday to allow for physics run at Miniball

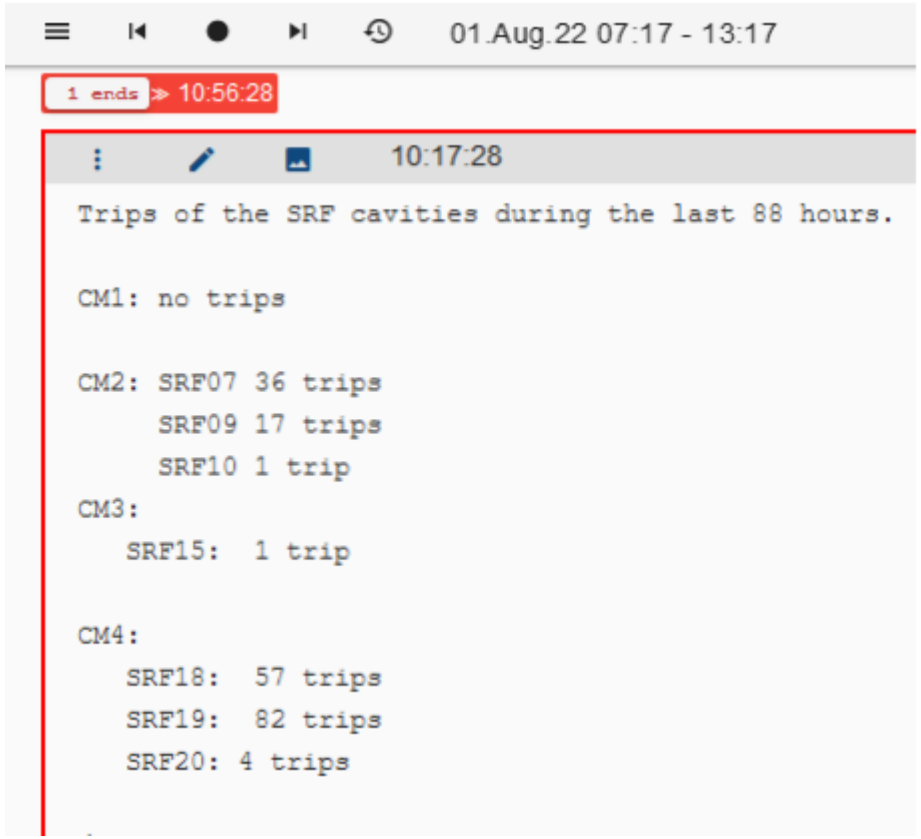
GPS schedule 2022

June				July				August					September				October					November			
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Pentecost 6	13	20	#758 UCx n 27	4	11	18	25	1	8	15	22	29	5	12	19	26	3	#779 LaC 10	#782 UCx V07 17	24	31	#784 UC W 7	14	#619 or #772 Pb 21	28
										TISD and IS717		#776 UC n		TS 30h	XT03	IS698: 110, 108 Sn @ 4.9MeV/u	TBC UC			IS711 92, 94Kr @ 7.5MeV/u	#534 Sn				
EC-SLE		MIRACLS	TAS		#761UC			#776 UC n		#619 Pb			Jaume Ganovelis	#779 LaC			EC-SLE					IS697: 131Sb, 133Sb @ 4 MeV/u	IS587: 68Ni @ 5MeV/u		
IS668 + Colls		IS671 + tests	IS684			IS677 11Be @29-10MeV/u (Str Foil)	IS710 27Na @29-10MeV/u		TISD and IS717		IS703 IS602		IS680 30Mg @ 8MeV/u		IS698: 110, 108 Sn @ 4.9MeV/u	IS686 108Sn@8MeV/u	IS668 + colls	IS717	IS711 92, 94Kr @ > 7MeV/u	γ-MRI IS691	IS647 IS652 IS679 IS703			IS563: 182, 184Hg @ 4MeV/u	
RILIS: Ga			RILIS: Zn	RILIS: Zn		RILIS: Be	RILIS: Be	27Na	1.7GeV		199Hg	Stable to MB	RILIS: Mg	stable to MB/XT03	RILIS: Sn	RILIS: Sn	RILIS: Sn	1.7GeV	Kr beams	Xe beams	111Cd	RILIS: Sb	RILIS: Ni	Hg beams	
							27Na																		

ISOLDE Superconducting LINAC

- Frequent SRF cavities trips (high sensitivity to vibrations, LHe pressure variations…) and loss of available accelerating gradient after the winter thermal cycle
- Issue being closely followed by RF expert in collaboration with TE-CRG (change in operating parameters of the cryo-plant)
- RF team optimized the cavity sequencer to restart the cavity faster after a trip to reduce downtime.
- Performance from September onwards was better, although some cavities were unusable and remained off.

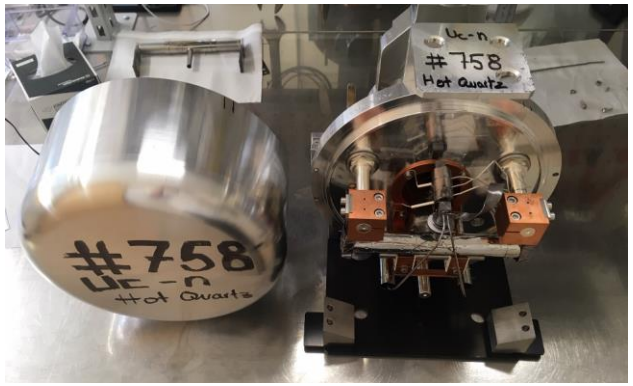
Summary of trips from 1st run of HIE ISOLDE in July 2022



Feedback from the running period

Targets:

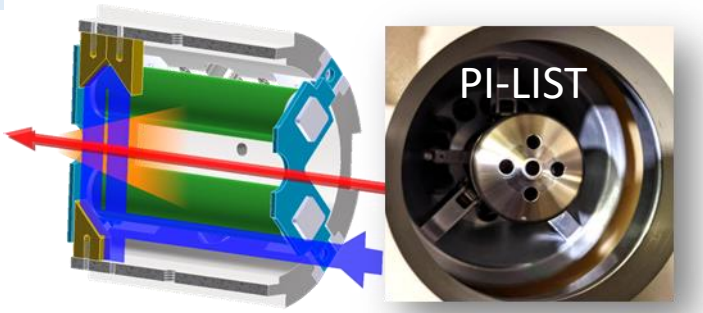
- 24 new units
- Many complex units to meet physics requirements
- Mostly excellent performance, improvements in handling (nanolab) are being seen . Several yields exceeded expectations especially for HIE ISOLDE physics.
- 3 Online failures (1 leak and 2 ion sources), but reliability has been good.
- Reusing targets for less exotic isotopes is increasingly accepted, and successful

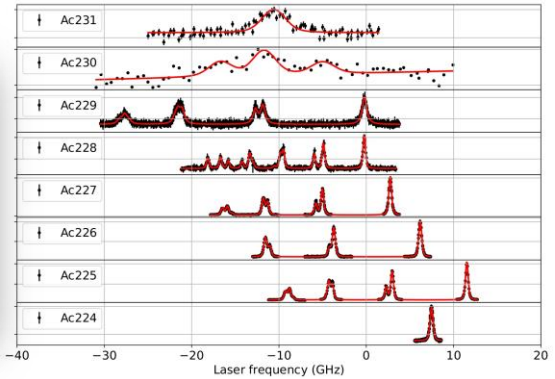


Target with «hot quartz» ion source: a complex ion source to suppress contaminants.

RILIS:

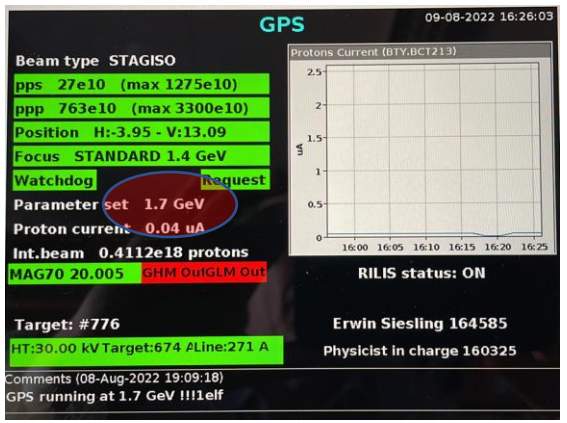
- Extremely busy year: 22 elements delivered for physics and development.
- Operated for 29 out of 36 weeks.
- Availability has been excellent, although support from Gatchina (RU) was missed.
- First year that LIST/PI List ran regularly for physics. Significant setting up time required, but very successful runs.

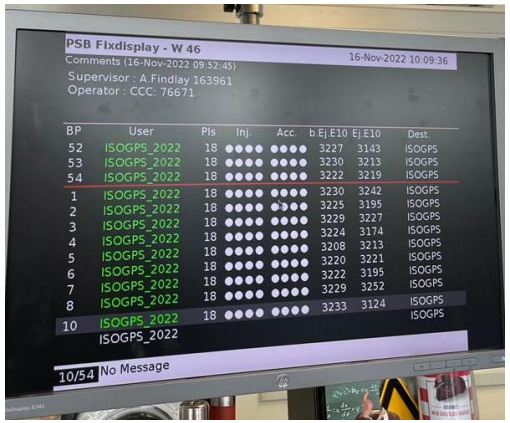




Protons:

- Availability and interactions with Booster team has been excellent throughout the year.
- 2022 saw many requests: NORMGPS/HRS; STAGISO_GPS/HRS; «stacked cycles»; Spaced cycles; and for first time 1.7GeV.
- Total number of protons delivered to ISOLDE ~10^{20}





Feedback from 1.7GeV tests (IS717)

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

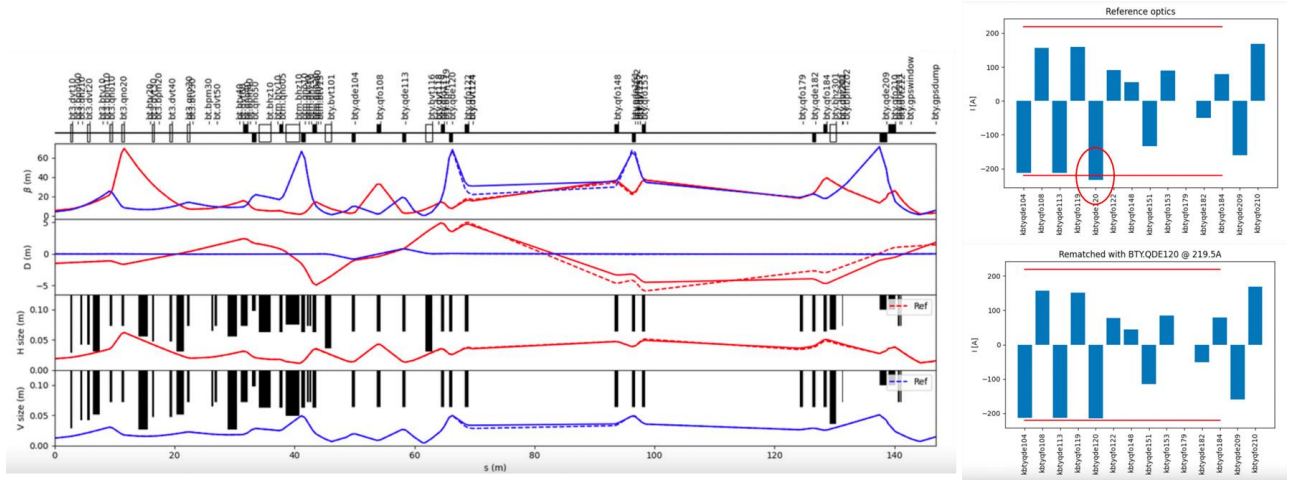
Proposal to the ISOLDE and Neutron Time-of-Flight Committee

Determination of radioactive ion beam production yields using 1.4- and 1.7-GeV protons

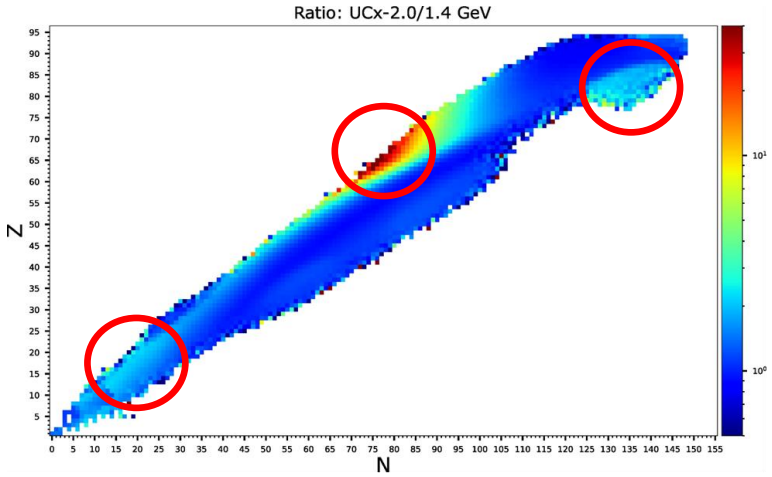
May 13, 2022

Simon Stegemann[1], Jose-Luis Sanchez Alvarez[1], Mia Au[1,2], Elodie Aubert[1], Ana-Paula Bernardes[1], Cyril Bernerd[1], Edouard Grenier-Boley[1], Marco Calviani[1], Francesco Cerutti[1], Katerina Chrysalidis[1], Thomas Elias Cocolios[3], Gian Piero Di Giovanni[1], Alexandre Dorsival[1], Charlotte Duchemin, Sean Freeman[1,4], Matthew Fraser[1], Simone Gilardoni[1], Reinhard Heinke[1], Karl Johnston[1], Ulli Köster[5], Giuseppe Lerner[1], Bruce Marsh[1], Fabio Pozzi[1], Francesc Salvat Pujol[1], João Pedro Ramos[6], Edgar Reis[1], Jose Alberto Rodriguez Rodriguez[1], Ralf Erik Rossel[1], Sebastian Rothe[1], Jose Maria Martin Ruiz[1], Maximilian Schütt[1], Erwin Siesling[1], Piotr Krzysztof Skowronski[1], Thierry Stora[1], Joachim Vollaire[1]

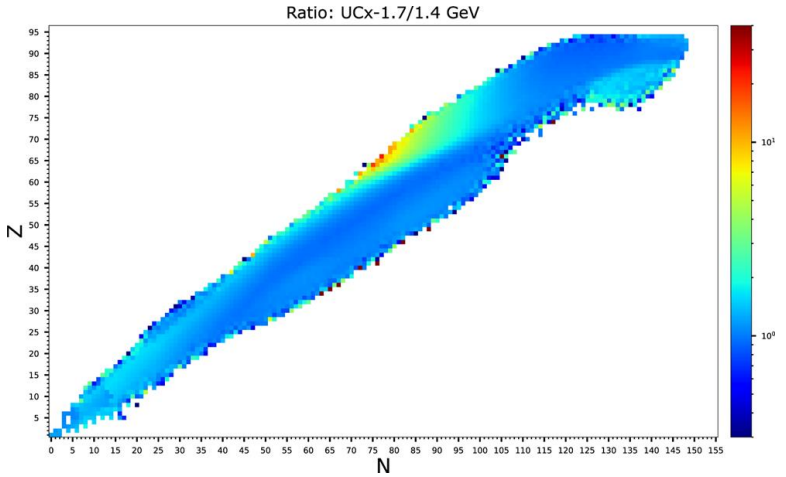
[1] *CERN, Switzerland*
[2] *Johannes Gutenberg-Universität Mainz, Germany*
[3] *KU Leuven, Institute for Nuclear and Radiation Physics, Heverlee, Belgium*
[4] *The University of Manchester, Manchester, UK*
[5] *Institut Laue-Langevin, Grenoble, France*
[6] *Belgian Nuclear Research Centre, SCK CEN, Mol, Belgium*



Optics model adapted for 1.7GeV. STAGISO beam: note higher energy, not yet full intensity



Fluka estimations



Measured yields

Clear increase in yield at 1.7GeV, verifying calculations. 2GeV protons will open new possibilities for physics.

Factors $\lesssim 2$ important, **experiments done in shorter time**

Factors $\lesssim 5$ important, allows **experiments with new isotopes**

Summary of requests from last INTC in February

Subject area	periment nu	Type	Facility	Outcome	Sum of Shifts requested	Sum of shift awarded
Collection	IS725	Proposal	ISOLDE	Full	12	12
Cross section	TOF78	Proposal	nTOF	Full	0	
	TOF79	Proposal	nTOF	Full	0	
	TOF80	Proposal	nTOF	Partial	0	
Decay Spectroscopy	IS733	Proposal	ISOLDE	Full	15	15
	(blank)	Proposal	ISOLDE	Not supported	16	0
HIE ISOLDE	IS702	Addendum	ISOLDE	Letter of clarification	18	0
	IS724	Letter of cla	ISOLDE	Full	12	12
	IS727	Proposal	ISOLDE	Full	15	15
	IS731	Proposal	ISOLDE	Full	20	20
	(blank)	Proposal	ISOLDE	Letter of clarification	39	0
Laser spectroscopy	(blank)	Proposal	ISOLDE	Letter of clarification	19	0
Magnetic moments	IS729	Proposal	ISOLDE	Full	11	11
Mass Spectrometry	IS726	Proposal	ISOLDE	Full	17	17
Negative ions	IS728	Proposal	ISOLDE	Full	15	15
Nuclear medicine	IS688	Addendum	ISOLDE	Full	10	10
	IS691	Addendum	ISOLDE	Full	18	18
SSP	IS668	Addendum	ISOLDE	Full	20	20
	IS730	Proposal	ISOLDE	Full	8	8
	IS732	Proposal	ISOLDE	Full	8	8
	LOI248	Letter of int	ISOLDE	Full	8	8
	LOI249	Letter of int	ISOLDE	Full	9	9
	LOI250	Letter of int	ISOLDE	Full	8	8
	LOI251	Letter of int	ISOLDE	Full	3	3
	(blank)	Proposal	ISOLDE	Letter of clarification	28	0
Upgrades	LOI252	Letter of int	ISOLDE	Endorse	0	0
Grand Total					329	209

Busy meeting: 27 ISOLDE documents

ATTENTION:

Next meeting May 31-June 1

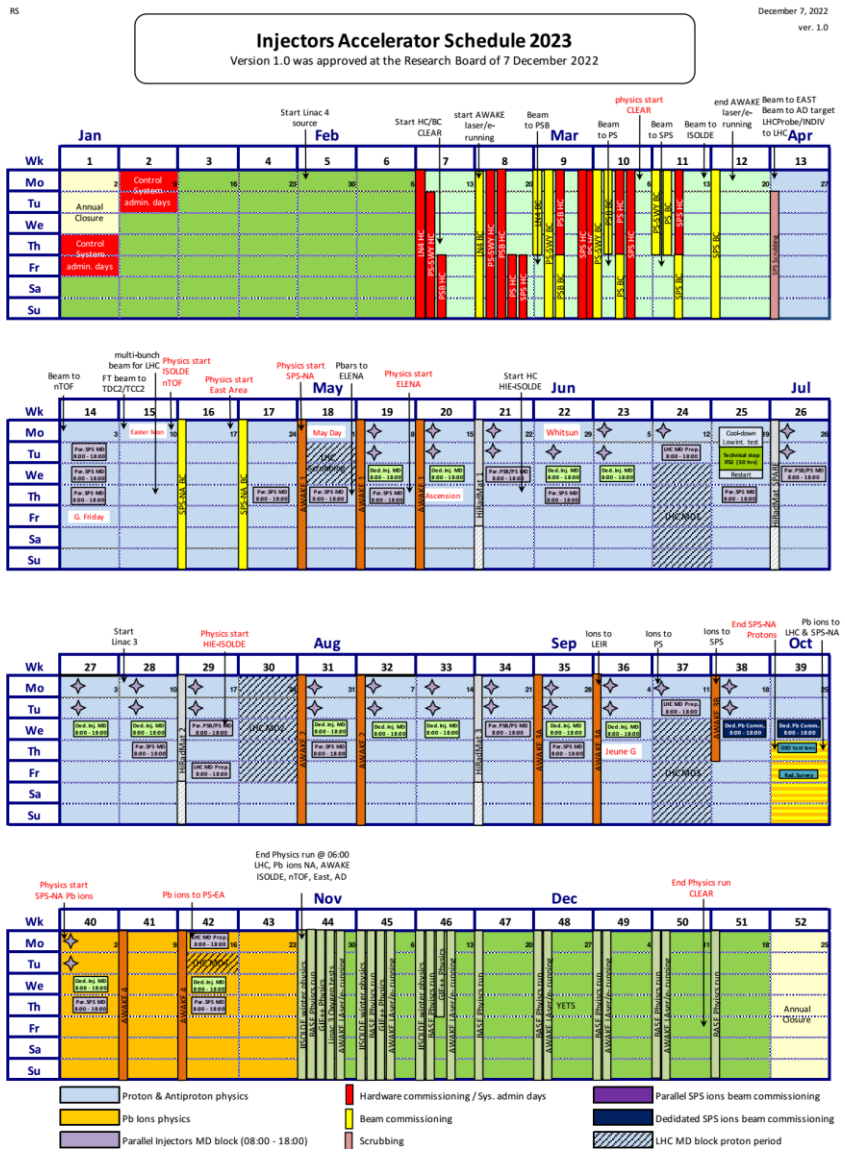
Call to go out after RB next week

Setup	HIE ISOLDE setup	Count of Exp. no.	Sum of Shifts remaining beginning of 2023 after INTC
biophysics	N/A	1	2.5
COLLAPS	N/A	5	36
Collections: 108Ag	N/A	1	30
Collections: 163Ho	N/A	1	5
CRIS	N/A	9	96
Gandalph	N/A	2	23
Gandalph/CRIS	N/A	1	3
HIE ISOLDE	ISS	15	136
	ISS/Miniball	2	22
	Miniball	17	245
	Prototype	1	0
	SEC	1	0
	XT03	1	23
	XT03: Actar	1	21
	XT03: Corset	1	12
	XT03: Edinburgh	1	42
IDS	N/A	14	119
IDS/ISOLTRAP	N/A	1	6
ISOLTRAP	N/A	7	62
Medical physics	N/A	2	30
MIRACLS	N/A	1	17
SSP	N/A	15	127
TAS	N/A	5	40
TISD	N/A	13	86
TISD/IDS	N/A	1	0
Travelling Setup	N/A	2	17
Travelling Setup; EC	N/A	1	0
VITO	N/A	3	26
WISARD	N/A	1	24
TISD/Miniball	Miniball	1	4
TISD/TDPAC	N/A	1	4
Decay spectroscopy	N/A	1	23
LA1/ECSLI	N/A	1	28
Collection for nTOF	N/A	1	45
IDS/TAS	N/A	1	3
ASCII	N/A	1	8
Multipac	N/A	1	9
SSP/TISD	N/A	1	3
ISOLDE upgrade	N/A	1	0
Collection: Heidelbe	N/A	1	12
Grand Total		**137**	**1389.5**

ISOLDE experiments which are valid until end of run3

HIE ISOLDE about 40% of the backlog

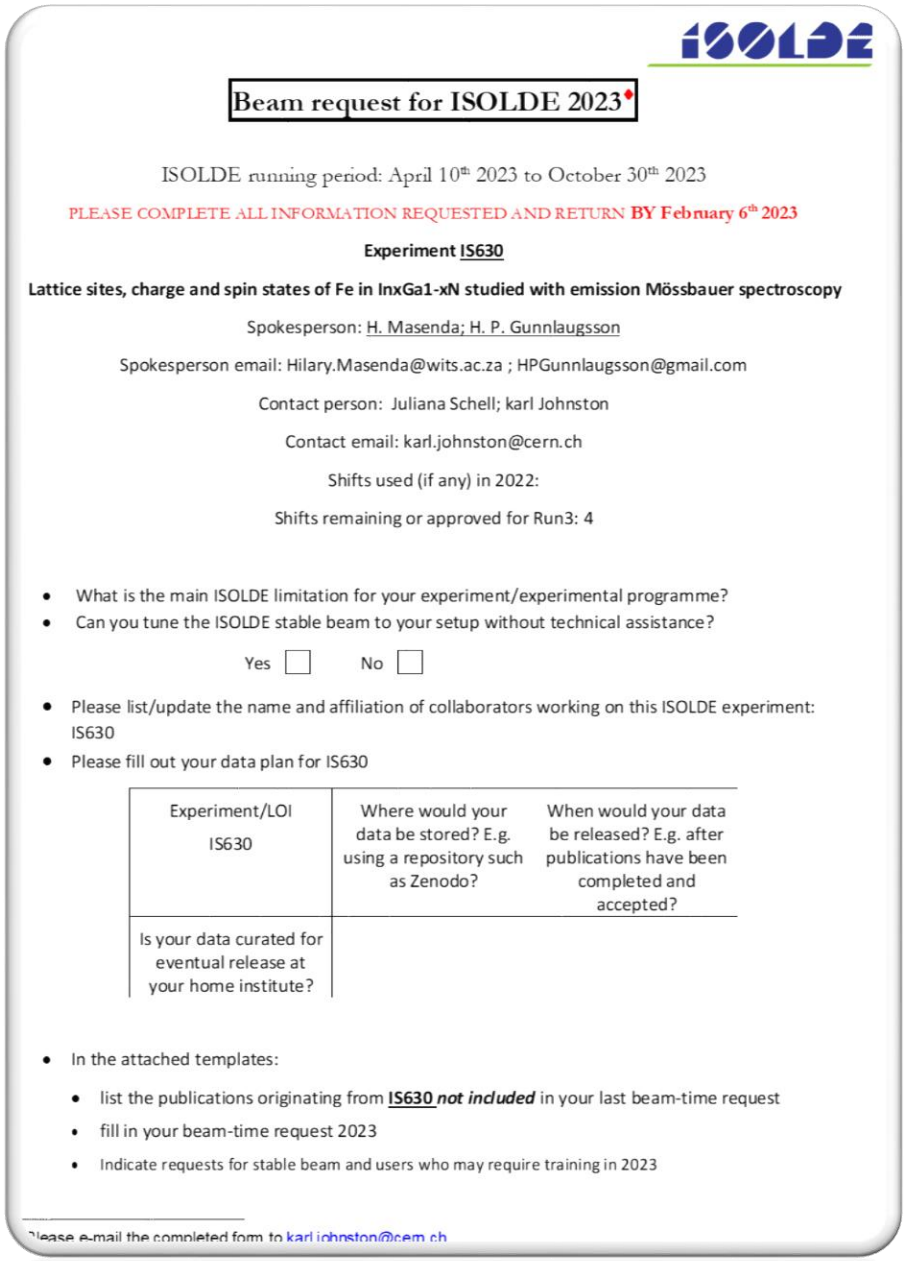
Low energy experiments have been topped up since last meeting, especially for SSP.



Key dates for 2023

	ISOLDE	nTOF	AD/ELENA	PS EA FT	SPS NA FT
p (p-) start	April 10th	April 10th	May 11th	April 17th	May 1st
p (p-) end	October 30th	October 30th	October 30th	October 30th	September 28th
Pb ion start				October 16th	October 2nd
Pb ion end				October 30th	October 30th
Weeks 2023 (weeks 2022) % wrt 2022	**29** (35 in 2022) 83%	**29** (35 in 2022) 83%	**24.4 p-** (30.5 in 2022) 80% of the shortened 2022 run	**28 p** (35 in 2022) 80% **2 Pb** (5 days in 2022)	**21.5 p** (29 in 2022) 74% **4 Pb** (2 in 2022)

Relatively short run with protons in 2023. Energy considerations means all accelerators will run ~20% less than 2022.
Chance of prolonged winter physics period from Oct 30th onwards. Now explicitly reserved in the master accelerator schedule.



ISOLDE

Beam request for ISOLDE 2023

ISOLDE running period: April 10th 2023 to October 30th 2023

PLEASE COMPLETE ALL INFORMATION REQUESTED AND RETURN **BY February 6th 2023**

Experiment IS630

Lattice sites, charge and spin states of Fe in InxGa1-xN studied with emission Mössbauer spectroscopy

Spokesperson: H. Masenda; H. P. Gunnlaugsson

Spokesperson email: Hilary.Masenda@wits.ac.za ; HPGunnlaugsson@gmail.com

Contact person: Juliana Schell; karl Johnston

Contact email: karl.johnston@cern.ch

Shifts used (if any) in 2022:

Shifts remaining or approved for Run3: 4

- What is the main ISOLDE limitation for your experiment/experimental programme?
- Can you tune the ISOLDE stable beam to your setup without technical assistance?

  Yes ☐ No ☐
- Please list/update the name and affiliation of collaborators working on this ISOLDE experiment: IS630
- Please fill out your data plan for IS630

Experiment/LOI IS630	Where would your data be stored? E.g. using a repository such as Zenodo?	When would your data be released? E.g. after publications have been completed and accepted?
Is your data curated for eventual release at your home institute?		

- In the attached templates:
  - list the publications originating from **IS630 *not included*** in your last beam-time request
  - fill in your beam-time request 2023
  - Indicate requests for stable beam and users who may require training in 2023

Please e-mail the completed form to karl.johnston@cern.ch

- Beam requests have been received in early Feb, and new experiments next Monday.
- So far 925 shifts requested (and more coming)

- **Eurolabs support is available, similar to previous TNA support.**

- **NOTE: in addition to open access publishing, data plan is now required to receive funding. Now a feature of the beam request.**

ISOLDE Schedule 2023: weeks 14 - 24

GPS schedule 2023

	April				May				June	
WK	14	15	16	17	18	19	20	21	22	23
MO	#777 Ta LIST 3	10	#818 UC 17	24	1	8	15	22	29	#534 Sn VD5 5
TU		LOI246 LOI235 LOI226		IS693	IS688 (nights)	#759 UC q n		LOI246		IS679 IS713 IS732 LOI248 LOI249 LOI250
WE								#727M Pb VD5	IS703 (GLM)	
TH	rare earths		TAS IS693	#812 Ta			Pentecost			
FR	G. Fri									
SA								TAS IS707		
SU							IS685			
	RILIS Cd	RILIS REs	RILIS In	RILIS In	RILIS Dy		RILIS Cd	RILIS Hg	RILIS Ac	111Cd

HRS schedule 2023

	April				May				June	
WK	14	15	16	17	18	19	20	21	22	23
MO	TBC 3	10	17	24	1	#816 UC 8	15	22	29	5
TU		Time available for tests to CRIS		#791 ThC VD5	TISD (days until Weekend)					TBC
WE										
TH						COLLAPS IS718	Pentecost			
FR	G. Fri			TISD FTS/ISOLTRAP				#817 UC	CRIS IS700	
SA										
SU										
	RILIS Al	RILIS Al	RILIS Al	RILIS Tl	RILIS Tl	RILIS Tl	RILIS Al	RILIS Al	RILIS Al	RILIS Ac

Count	Numbe	planne	Type	n in plac
1	LOI246	17	LOI	No
2	LOI235	3	LOI	No
3	LOI226	3	LOI	No
4	IS693	22	EXP	Yes
5	IS688	4	EXP	Yes
6	TISD	20	Development	No
7	IS718	15	EXP	No
8	IS685	12	EXP	Yes
9	LOI246	6	LOI	No
10	IS707	13	EXP	Yes
11	IS703	1	EXP	Yes
12	IS700	7	EXP	Yes
13	IS679	2.5	EXP	No
14	IS713	3	EXP	Yes
15	IS732	1	EXP	Yes
16	LOI248	1	LOI	No
17	LOI249	2	LOI	No
18	LOI250	4	LOI	No

- Some reluctance to run early
- Relatively non standard targets on GPS

Start of protons for physics: 10 April
End of protons for physics: 30 October

Target change | CERN holiday | Setting up/proton scan/yield | Physics HPS | Physics GRS | RILIS run

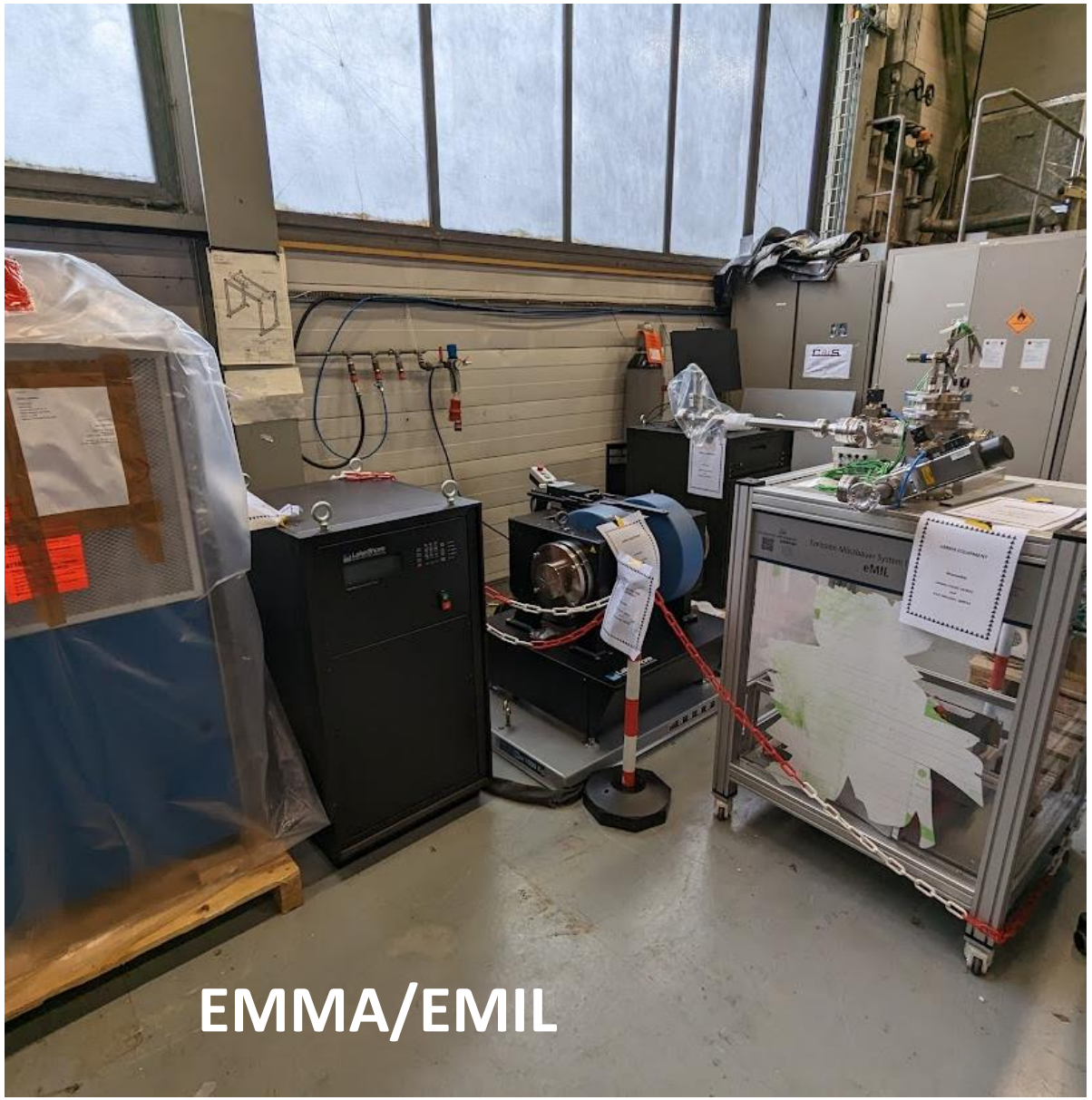
KJ: 28.03.23

B275: Multipac setup
LOI249

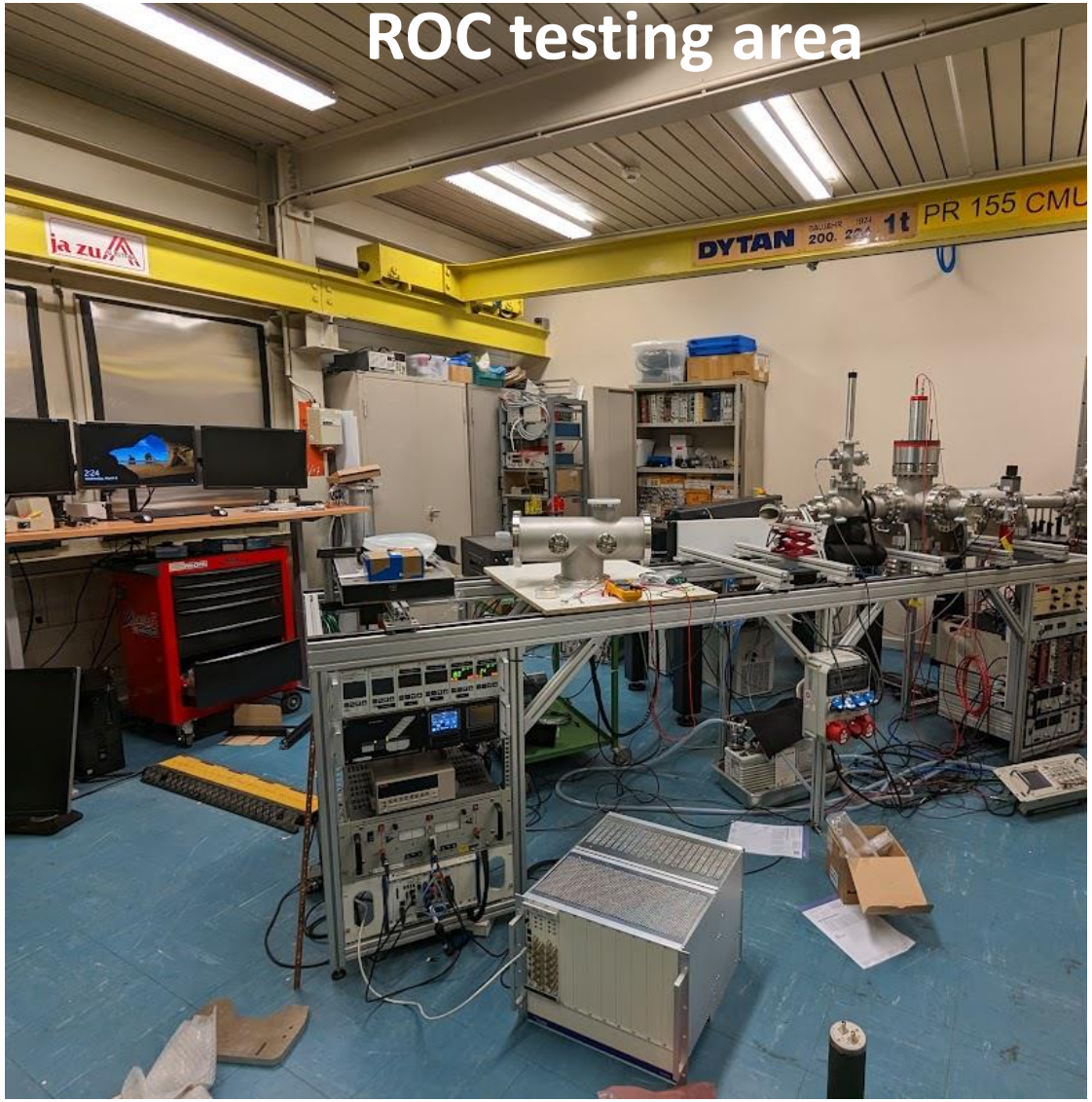

GAMMA


Refurbished ASPIC

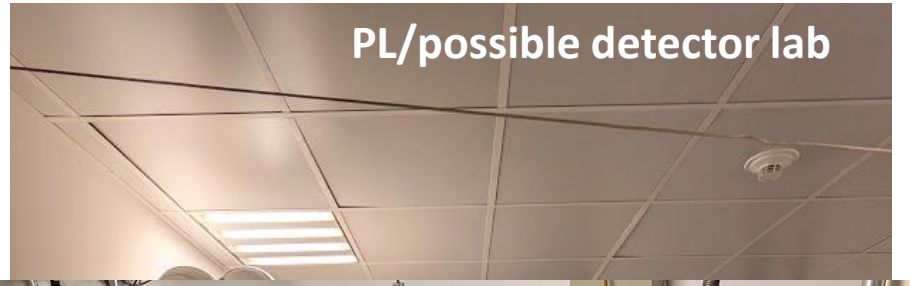

ASCII LOI248

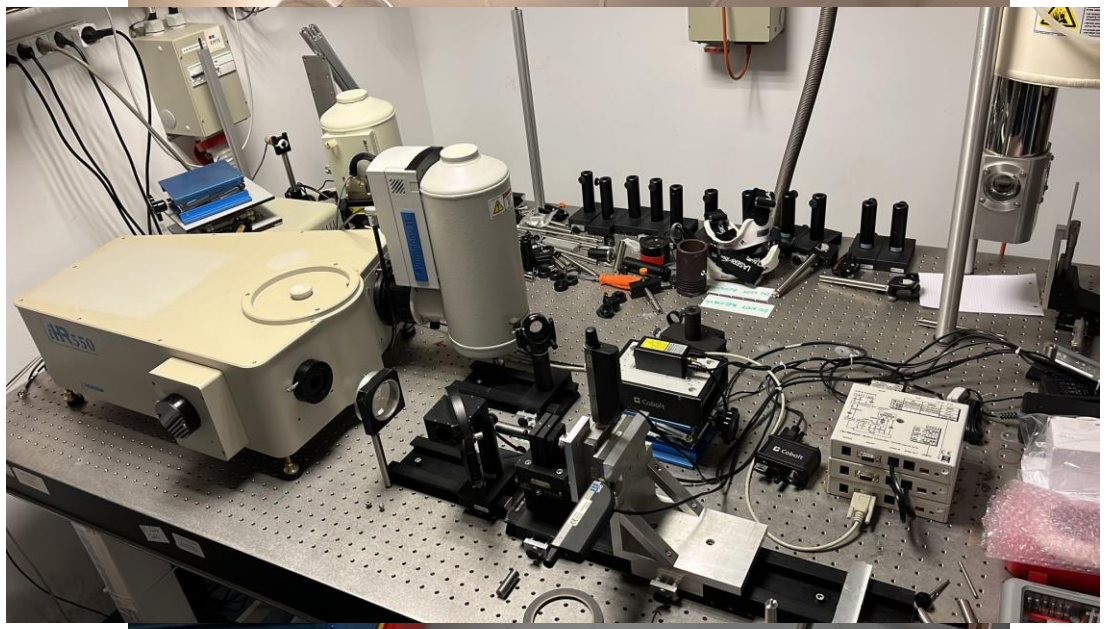

EMMA/EMIL

ROC testing area



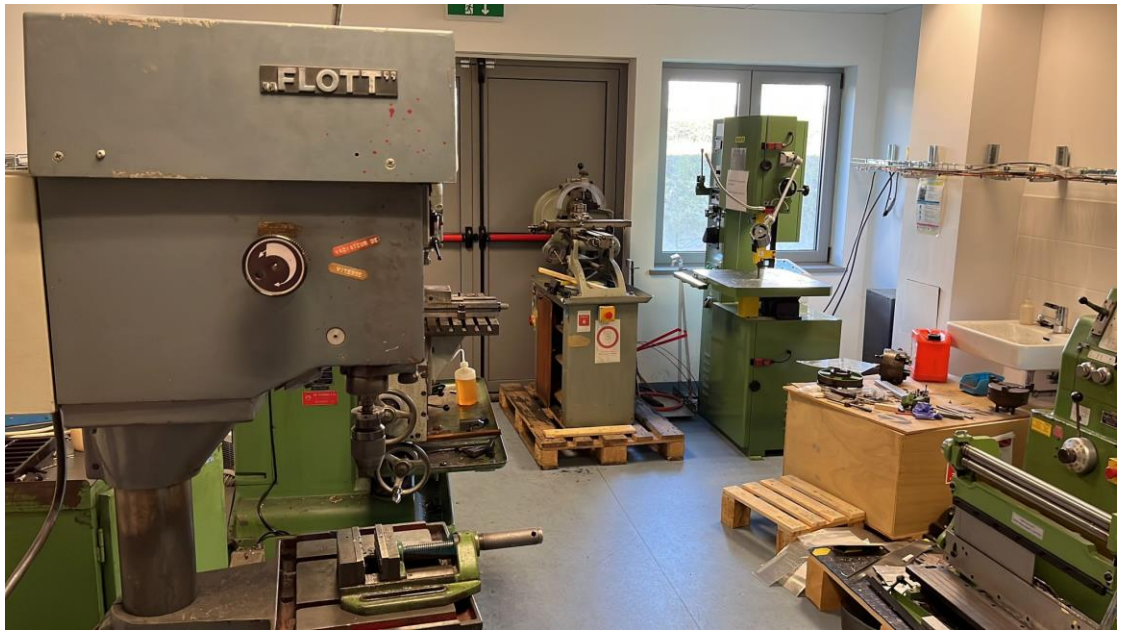
PL/possible detector lab



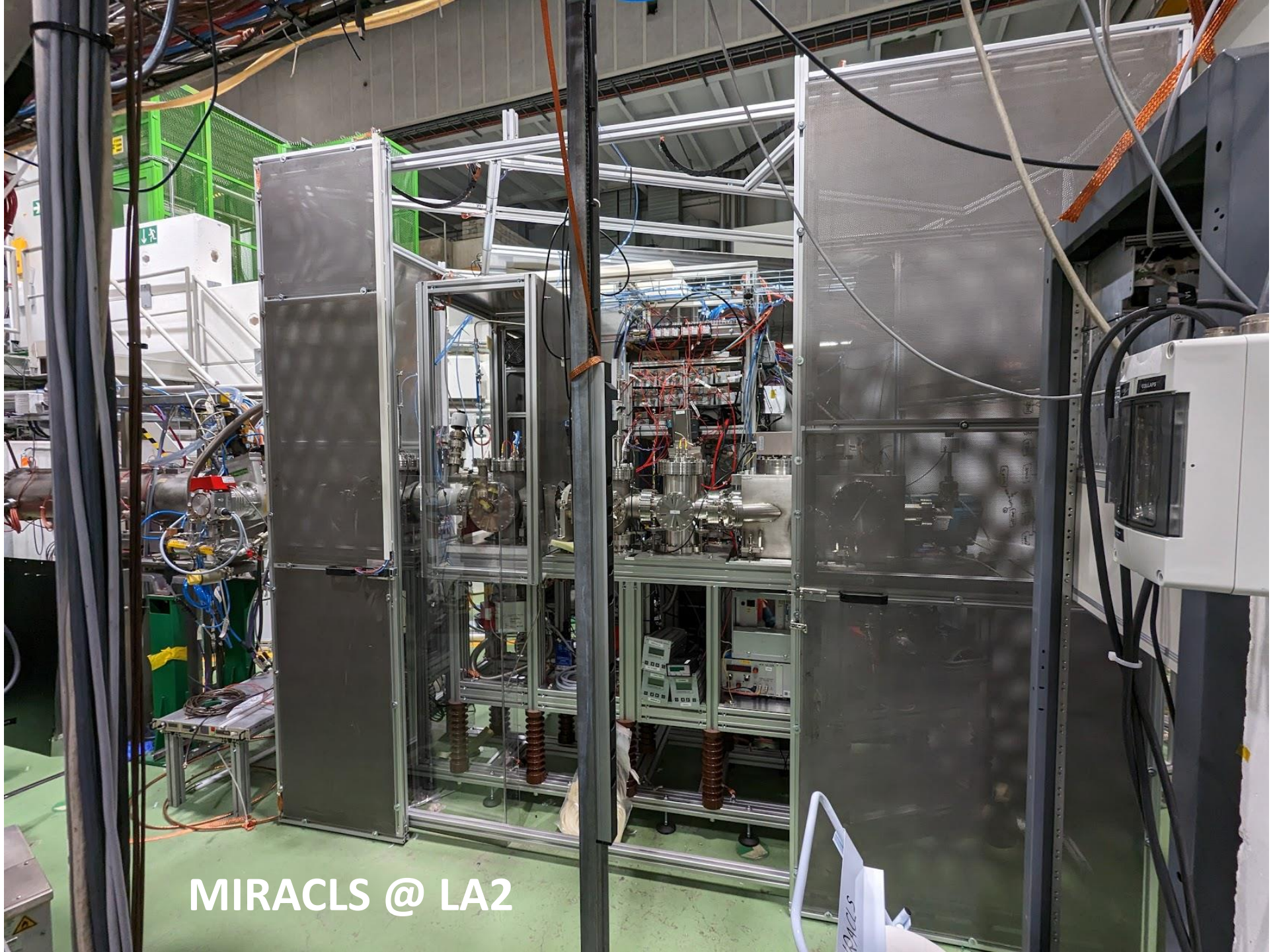


Chemical lab / workshop

Proposal for shielded fume cupboard (as at GLM)
New gloveboxes



Machines in need of conformity check and maintenance


MIRACLS @ LA2


CRIS beamline

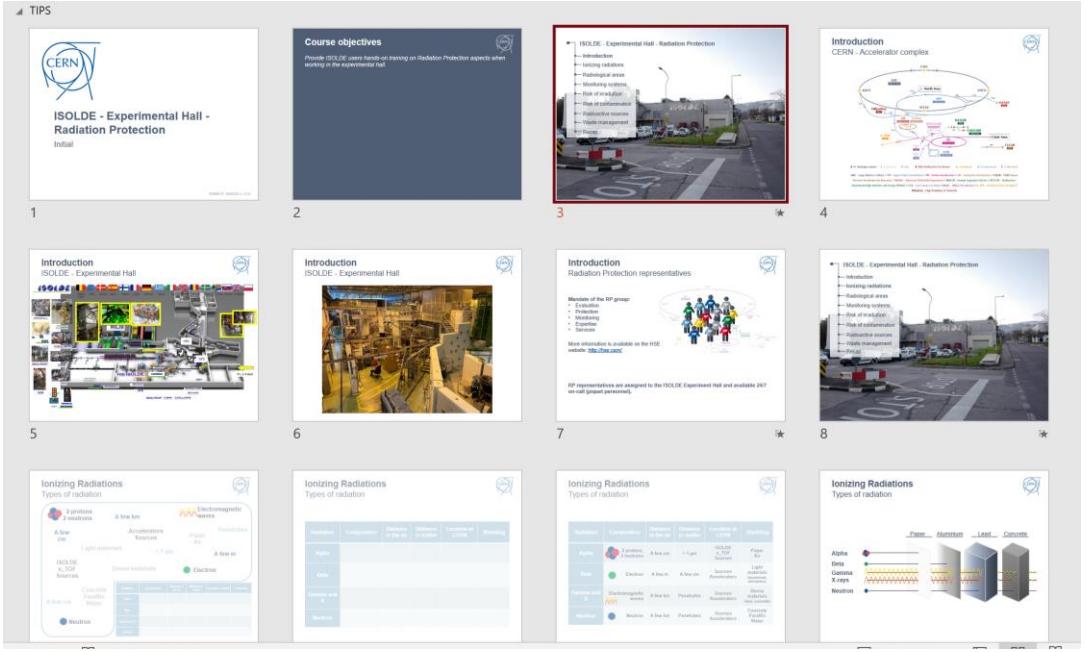
New IDS frame
Installation in
about 2-3 weeks

Training/access

- In addition to the (ever-growing) number of online courses…
- Hands-on RP and Electrical training
- 15 day deadline before scheduled course is cancelled. (has led to issues last year)
- In discussion with training regarding the registration for users who have not arrived to CERN.

- New EP-wide electrical course for all users/staff who need to work in an experimental area.
- Both will take place on Tuesday but time has increased:
  - EP course 0830 till 1230
  - RP course 1400 till 1630
- **<u>Taking all online courses will grant electrical training ranks (for the moment at least).</u>** Long term users based at CERN need to take it when possible.
- New workspace induction being considered…

Discussions about reducing training load for majority of users are ongoing



In LMS:

ISOLDE - Experimental Hall - Radiation Protection - Handling (Covid-19)

Electrical Safety - Working in EP experiments

NOTE: 2FA is coming for access to sites e.g. logbooks in 2023

Recent series of academic training lectures: available online at link below

https://indico.cern.ch/category/72/

- MIRACLS setup at LA2 making great progress
- Preparations for beam transport to PUMA at RC6
- New IDS frame will arrive this week