

EP-DT Group Meeting

A special welcome to all of you
who follow the meeting on Zoom!

December 9, 2021

Burkhard Schmidt

EP-DT Group Meeting

Thursday 9 Dec 2021, 14:00 → 17:00 Europe/Zurich

500/1-001 - Main Auditorium (CERN)

Burkhard Schmidt (CERN)

Videoconference

EP-DT Group Meeting

Join

500/1-001

- | | | | | |
|--------------|---------|---|-------|----|
| 14:00 | → 14:20 | Introduction and News
Speaker: Burkhard Schmidt (CERN) | 🕒 20m | 🗑️ |
| 14:30 | → 14:42 | DT contribution to ALICE (Upgrade I and ITS3)
Speaker: Massimo Angeletti (CERN) | 🕒 12m | 🗑️ |
| 14:45 | → 14:57 | DT contribution to ATLAS (ITk)
Speaker: Ricardo Tavares Rego (CERN)
Speaker: Massimo Angeletti (CERN) | 🕒 12m | 🗑️ |
| 15:00 | → 15:12 | DT contribution to CMS (Tracker and HGCAL)
Speakers: Pierre Rose (CERN), Thorben Quast (CERN) | 🕒 12m | 🗑️ |
| 15:15 | → 15:27 | DT contribution to the LHCb Upgrade
Speaker: Preema Rennee Pais (CERN) | 🕒 12m | 🗑️ |
| 15:30 | → 15:50 | Coffee break | 🕒 20m | |
| 15:50 | → 16:00 | Silicon Detector R&D In DT
Speakers: Anja Himmerlich (CERN), Florian Dachs (CERN), Katharina Dort (CERN, Justus-Liebig-Universitaet Giessen (DE)) | 🕒 10m | 🗑️ |
| 16:00 | → 16:10 | Gas-based Detector R&D In DT
Speaker: Antonija Utrobicic (CERN) | 🕒 10m | 🗑️ |
| 16:10 | → 16:20 | Gas system Maintenance & Development
Speaker: Mara Corbetta (AGH University of Science and Technology (PL)) | 🕒 10m | 🗑️ |
| 16:20 | → 16:30 | DT Involvement In CO2 cooling
Speaker: Wojciech Krzysztof Hulek (CERN) | 🕒 10m | 🗑️ |
| 16:30 | → 16:40 | Magnet and Controls activities In DT
Speaker: Maciej Stanislaw Ostrega (CERN) | 🕒 10m | 🗑️ |
| 16:40 | → 16:50 | EP Irradiation facilities
Speaker: Giuseppe Pezzullo (CERN) | 🕒 10m | 🗑️ |
| 16:50 | → 17:00 | Concluding remarks | 🕒 10m | 🗑️ |

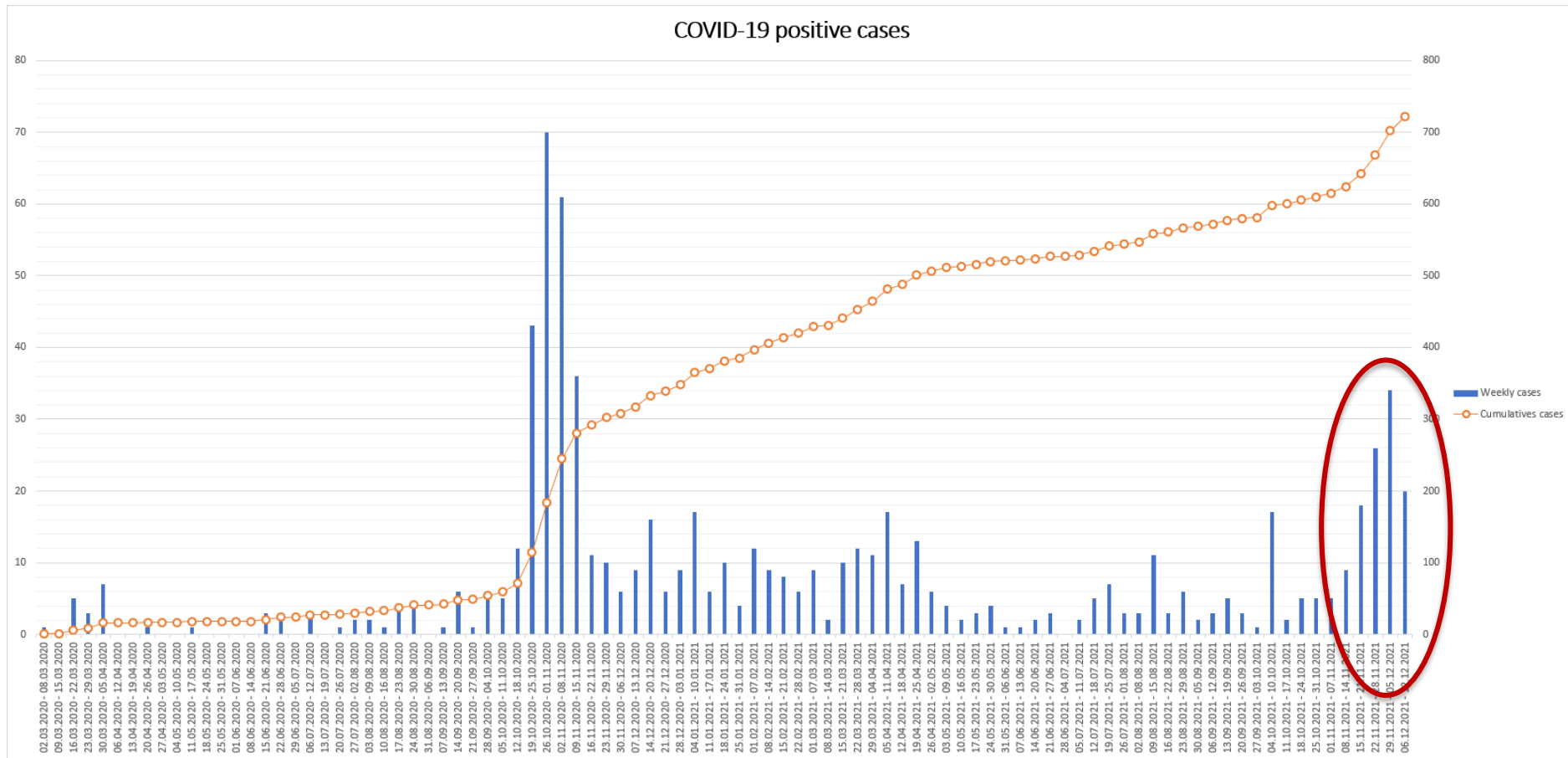
Social Event Mont Rond 23.09.

It was a beautiful
afternoon...



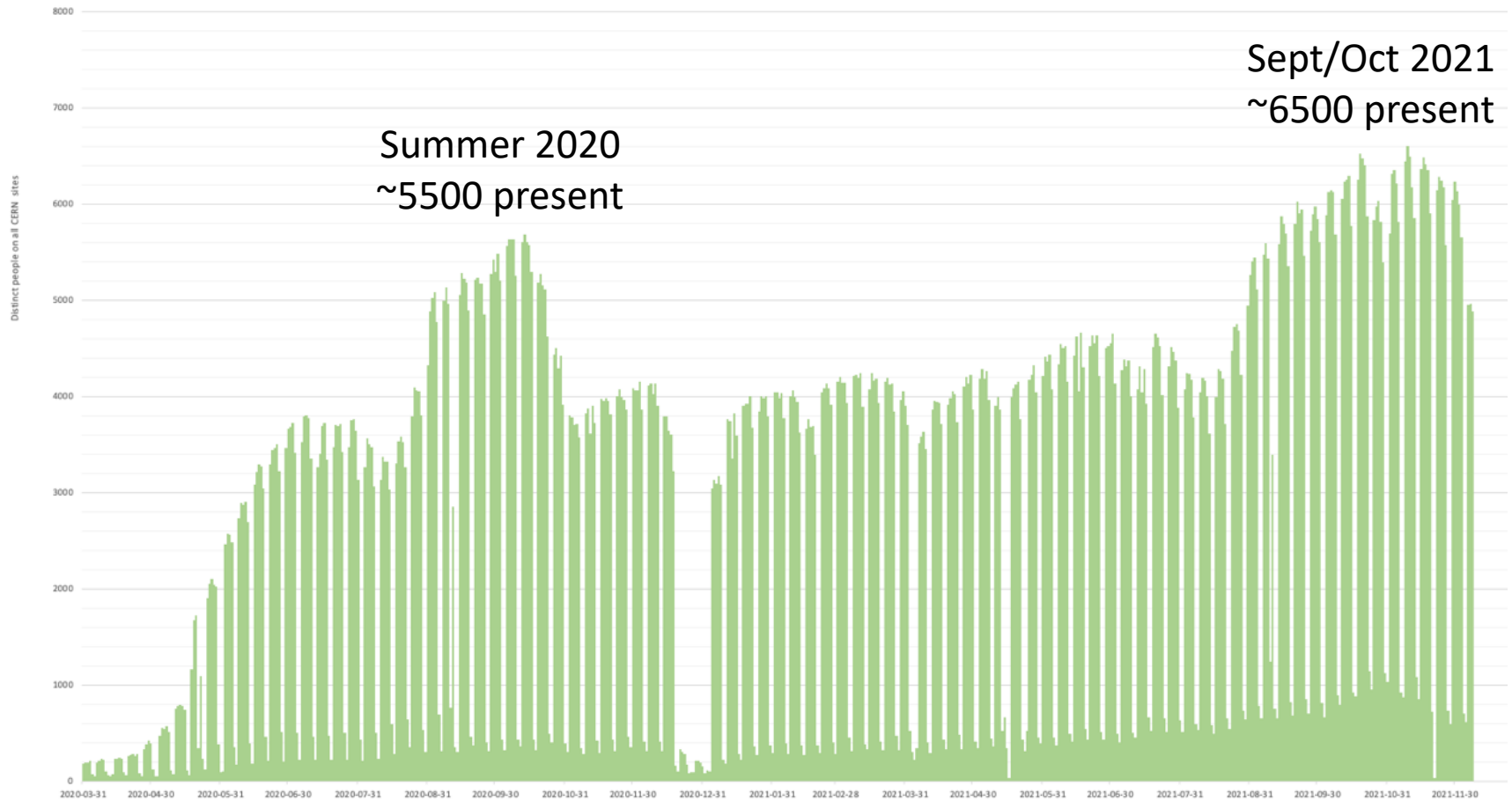
...to be repeated!

Covid-19 is still with us...



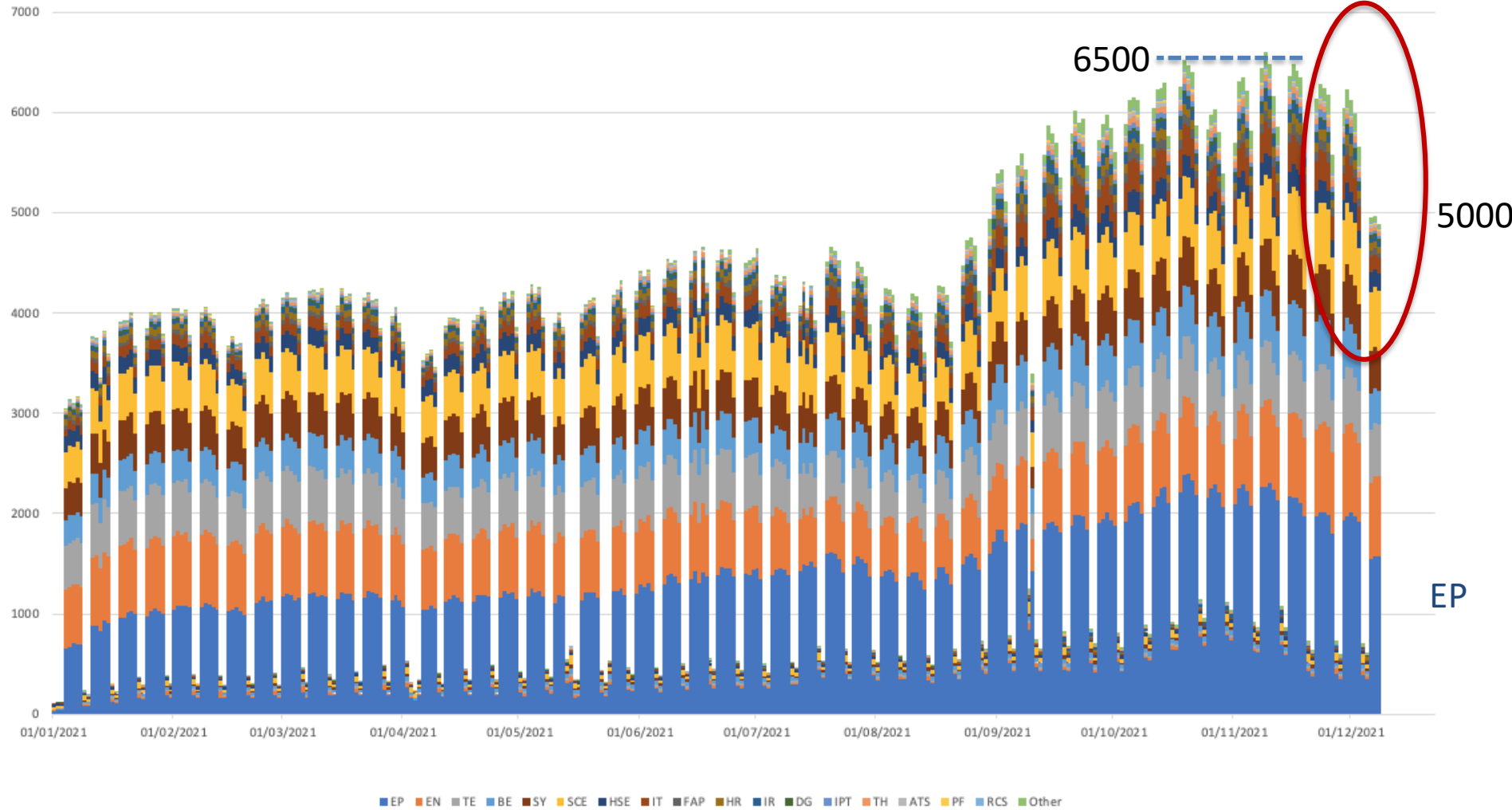
- The evolution of the pandemic demanded to go back to the 'orange' level at CERN with teleworking being the default way of work.
- We have to continue to be very careful and observe the hygiene measures.

Presence at CERN since March 2020

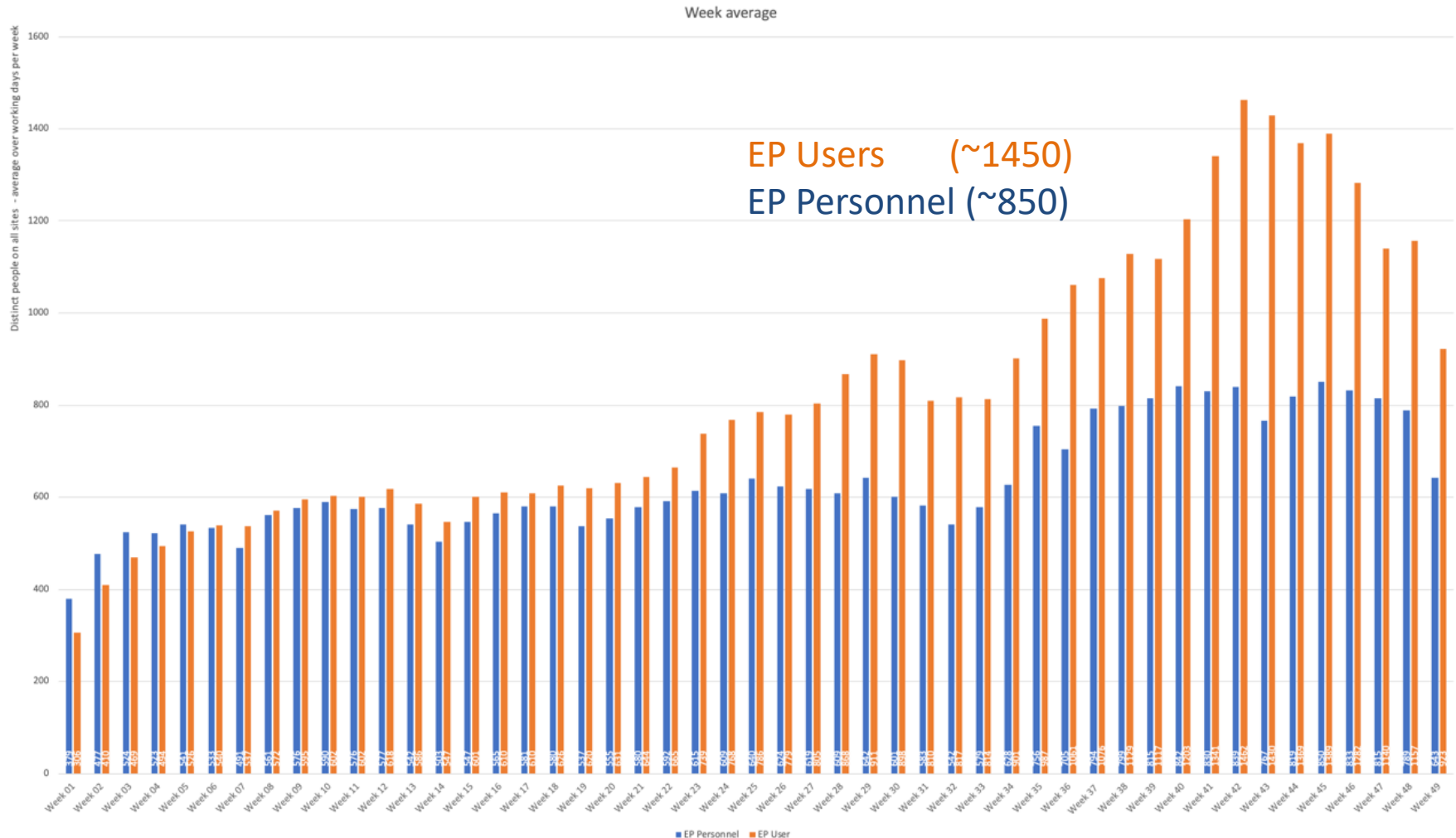


Presence at CERN this year

Individual persons on site by department

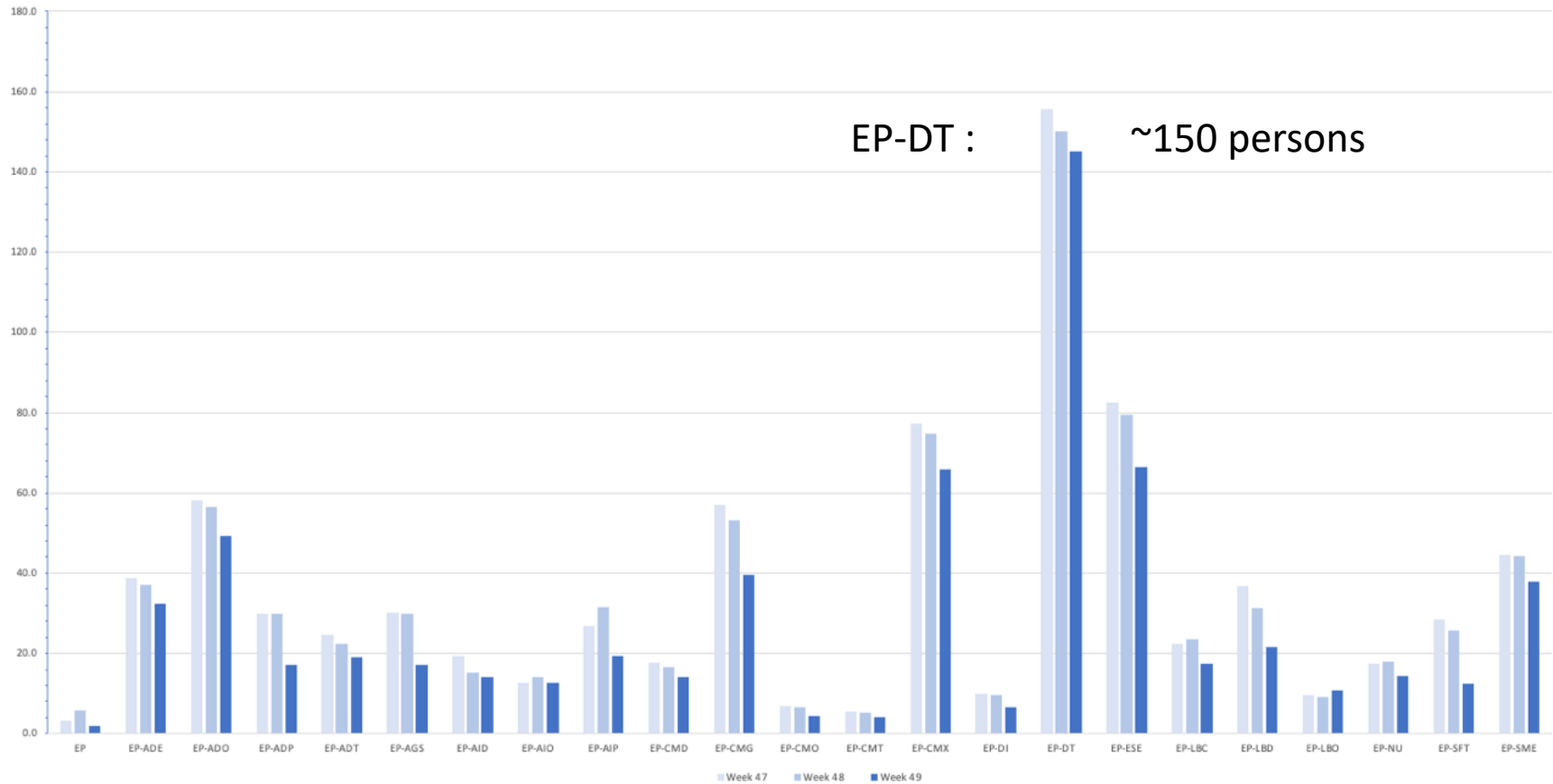


Presence for EP

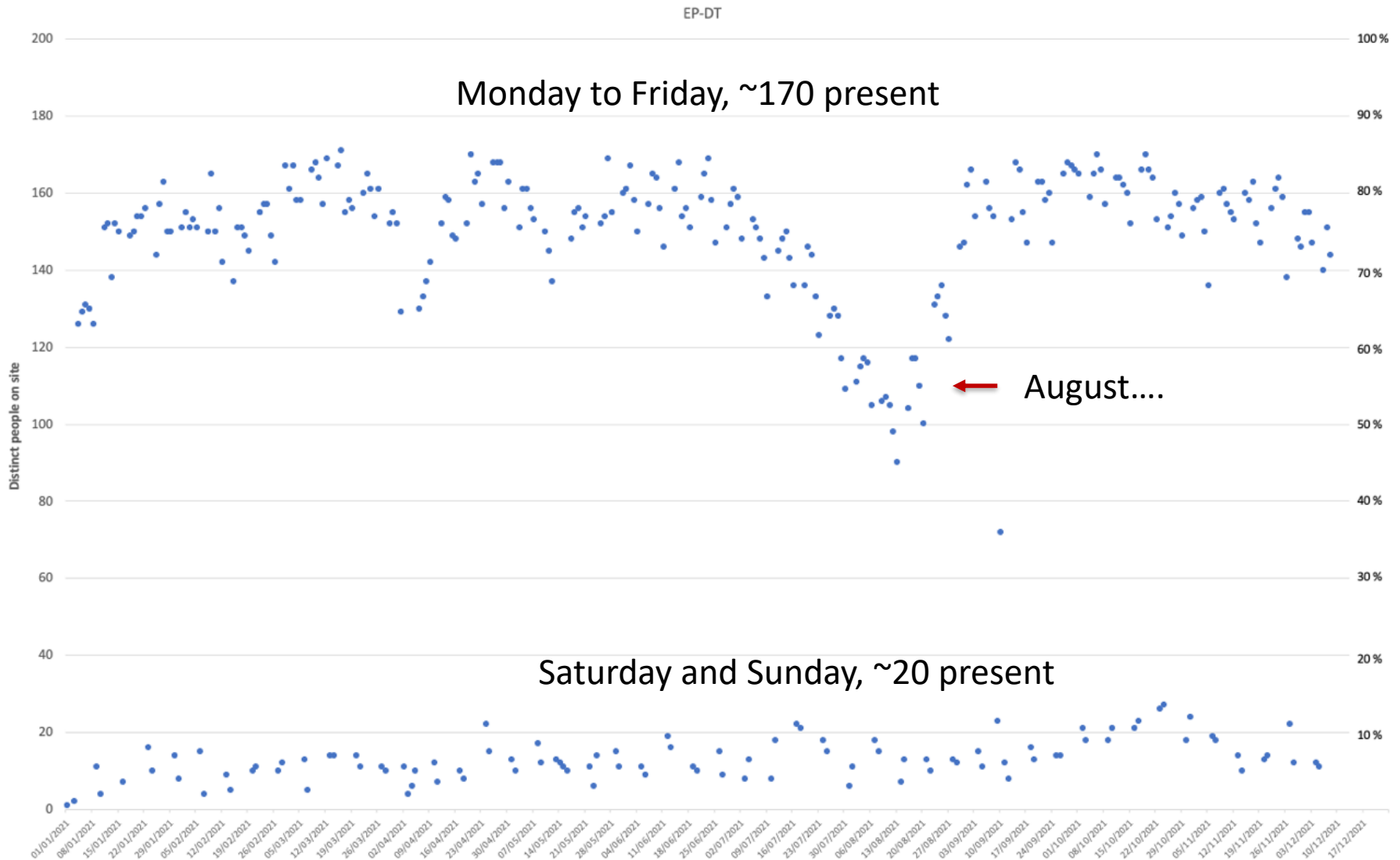


Presence on site for different EP groups

Average Presence on Site - Week Comparison



Presence on site for EP-DT



EP-DT Composition and Structure

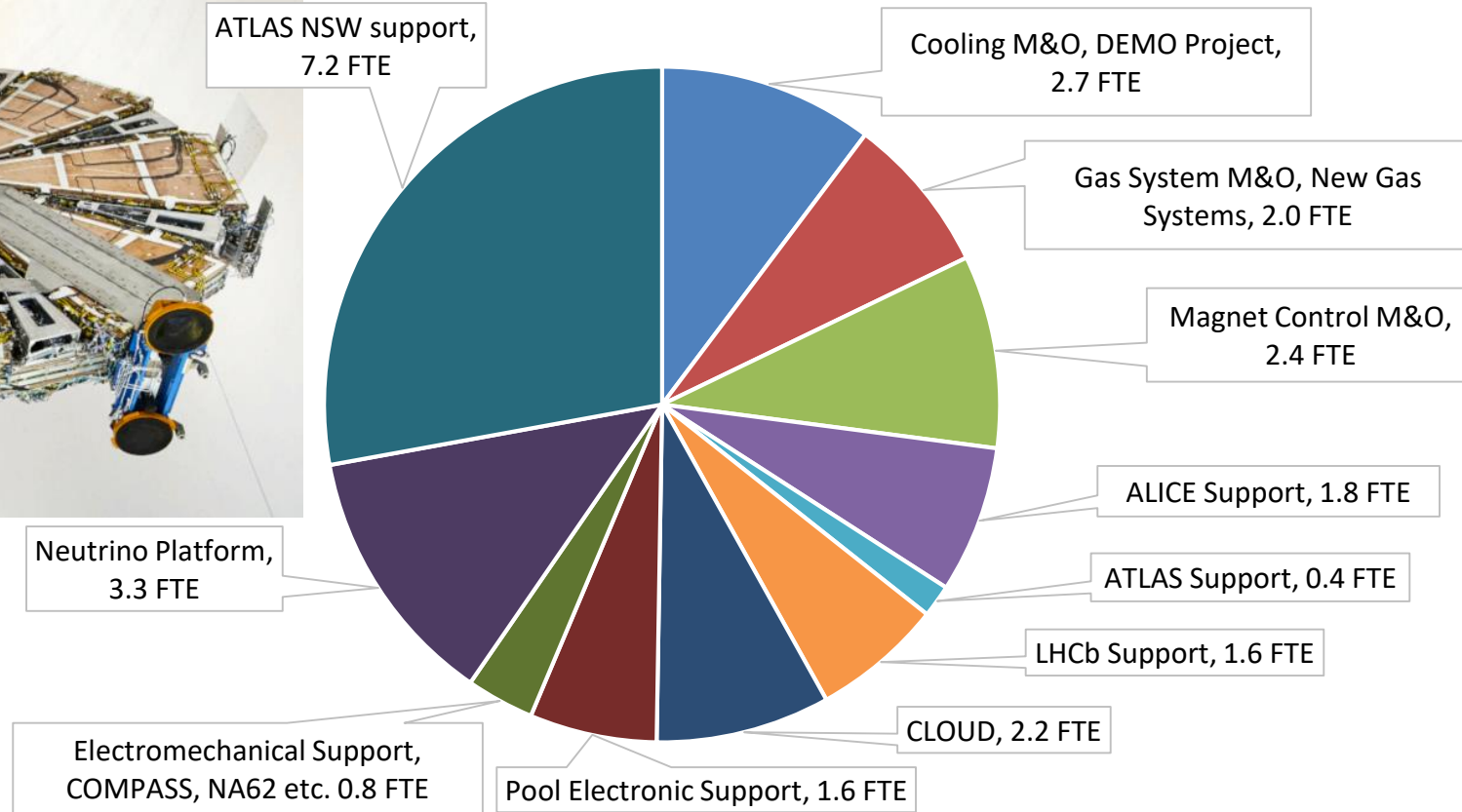
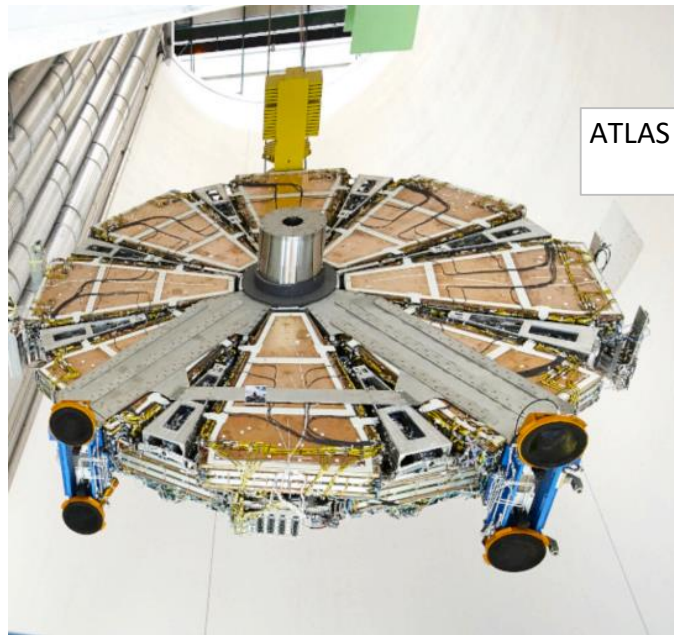
Section	Persons
Technology & Physics (TP) SL: Lucie Linssen	MPE: 12 MPA etc. 1
Detector Development (DD) SL: Petra Riedler	MPE: 18 MPA etc. 9
Fluidic Systems (FS) SL: Paolo Petagna	MPE: 25 MPA etc. 10
Detector Interface (DI) SL: Giovanna Lehmann	MPE: 13 MPA etc. 5
Engineering Facilities (EF) SL: Hans Danielsson	MPE: 14 MPA etc. -
Engineering Office (EO) SL: Andrea Catinaccio	MPE: 16 MPA etc. 4
Construction & Operations (CO) SL: Antti Onnela	MPE: 17 MPA etc. 3

Personnel	FTE 2021	(2020)
Staff	88	(90)
Fellows / TTE	29	(30)
PJAS/COAS	7	(12)
Doct. Students	19	(17)
Tech. Students	9	(14)
Trainees	6	(7)
FSU PH-02:	13	(12)
FSU PH-40:	17-26	(20)
Honorary Members	4	(2)
Total	~190	(204)

Comments:

- The numbers for 2020 show the DT composition after LCD members joined in July 2020.
 - 3 Staff members are on early retirement or long term sick leave
- The number of Staff members is rather stable – but it requires much effort to keep the level!
- Many Fellows, DOCT and TECH are affiliated to DT, but are only partially on DT quota.
- The Field Support Units PH-02 and PH-40 are crucial to fulfil our mission (~20% of workforce).

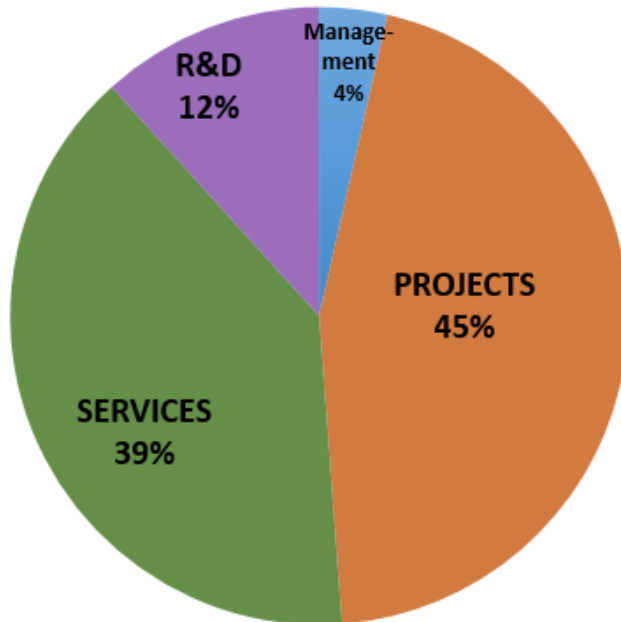
Activities of FSU PH-02 in 2021



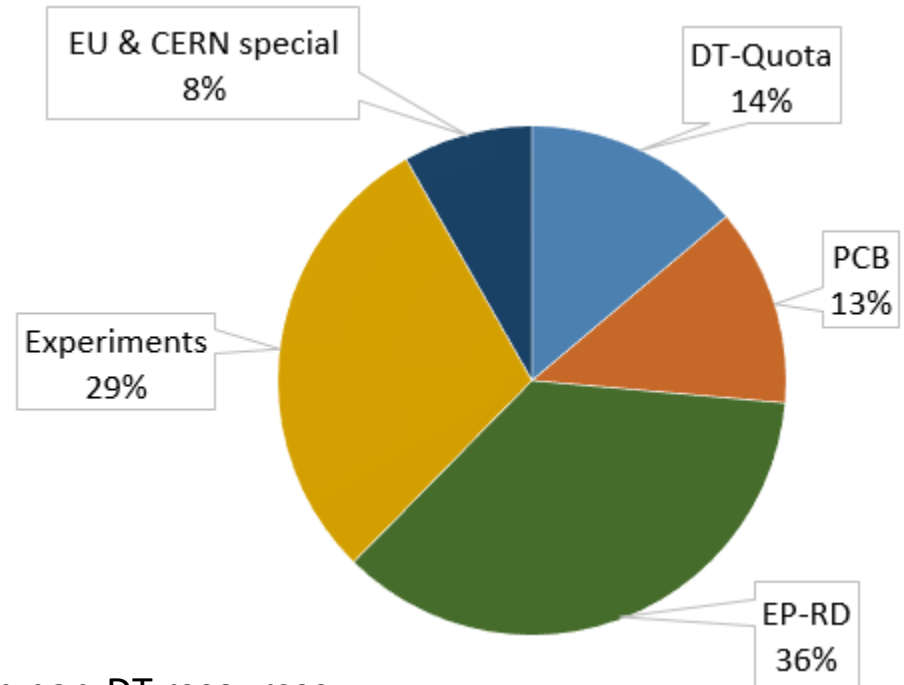
- Total of hours for 2021: 41,313 hours (~26 FTE) for a cost of about 2 MCHF
- With the completion of the ATLAS NSW, we are now down to 17 FTE
- **FSUs are an important resource to respond to urgent needs of the experiments**

Activities of Staff and Fellows in 2021

Involvement of Staff and Fellows



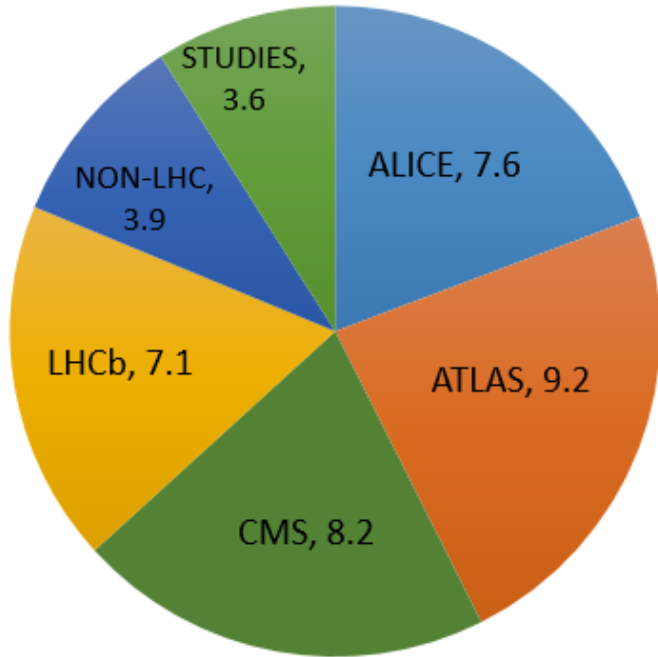
Funding Source of Fellows (w/o TTE)



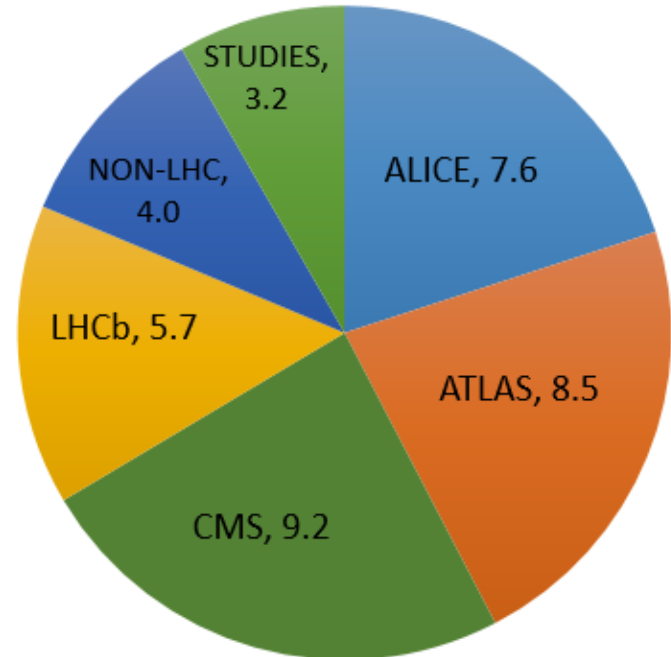
- DT based Fellows (and Students) are mainly on non-DT resources
- Very good collaboration with ATLAS, CMS and NA62 for funding Fellows/Students
- Fellows represent 50% of the resources for R&D
 - Involvement of DT in EP R&D WP 1, 2 and 4 was shown on the EP E&D Day
- Some Details on Projects and Services shown in the following
- See also EP-DT Annual Report (2020) <https://cds.cern.ch/record/2773334/>

DT Involvement in Projects

2021 (real)



2022 (planned)



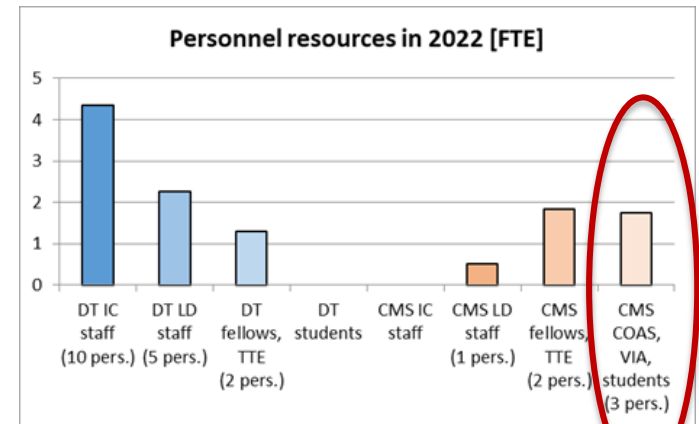
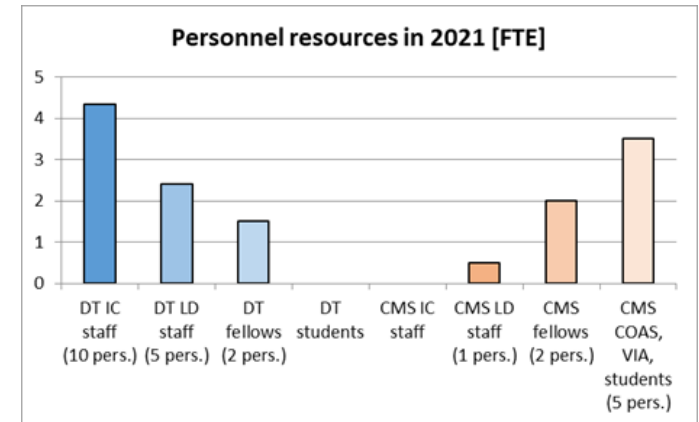
- Involvement in projects related to the upgrade of the LHC experiments is more than 80%.
- The remaining 20% are shared equally between other experiments and project studies.
- For 2021, we increased the contribution to LHCb compared to the plans and delayed it for CMS.
- The ATLAS contribution goes unfortunately down for next year due to contracts coming to an end

Contribution to the LHC experiments

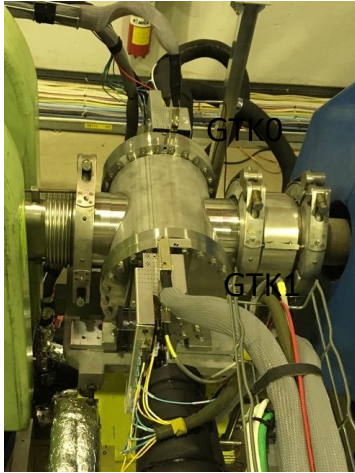
Contributions are specified in WPs between EP-DT and the Experiments:

- **ALICE and LHCb:**
 - WP for ALICE Upgrade [EDMS 1735648](#) until end LS2
 - WP for LHCb Operation and upgrade I until end of LS2: [EDMS 1735466](#) (+ several smaller WPs).
 - New WPs to be prepared for upgrade work until LS3
- **ATLAS:**
 - WP for the DT contribution to the ITk, including risk assessment: [EDMS 2065557](#).
 - DT is falling short with FTE resources by ~15%
 - Correction planned with help of ATLAS (TTE, etc.)
- **CMS:**
 - WP for DT contribution to HGCal under preparation
 - WP for DT contribution to Tracker upgrade, including risk assessment: [EDMS 1735474](#).
 - Several contributors have short term contracts (COAS, FCT, VIA, TECH)
 - For 2022 2.5 FTE (~20%) are missing

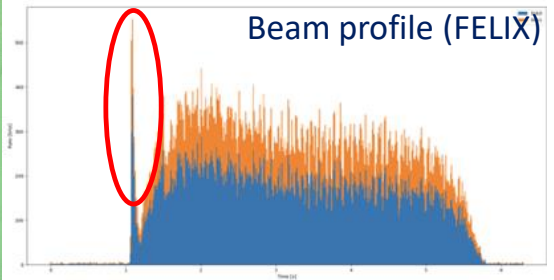
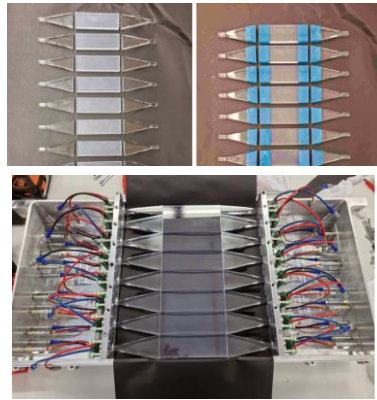
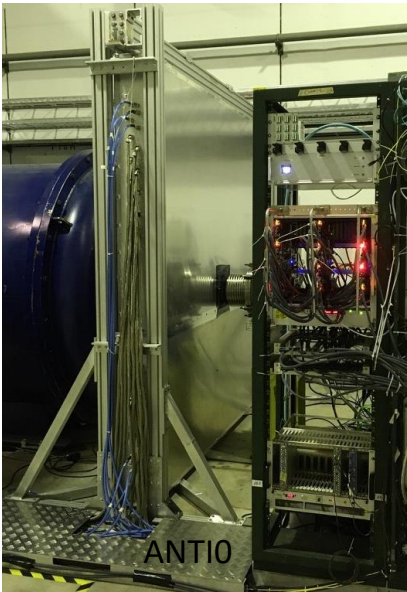
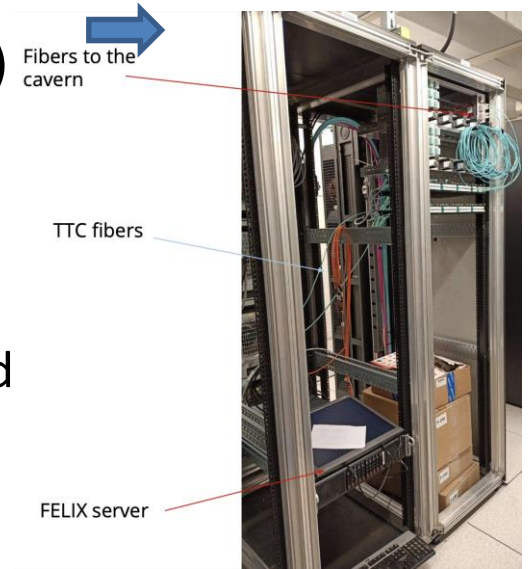
Details for CMS



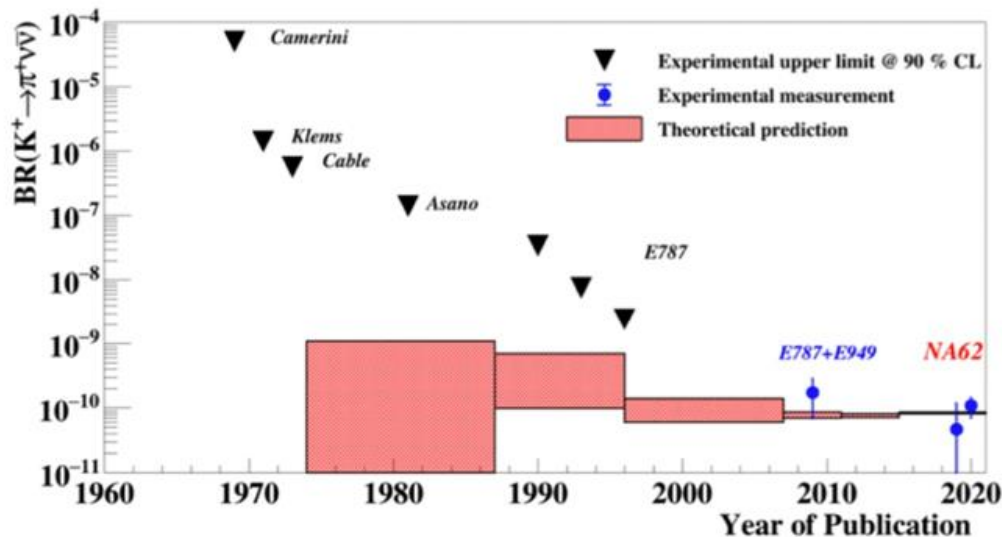
DT Contribution to NA62



- New FELIX readout for future higher rates with new TDC (EP-ESE)
- 4th GTK station and module production
- ANTI0 (assembled in 154)
- Gas systems, LKr calorimeter, TC....
- Veto counter to reduce background (assembled in 154)

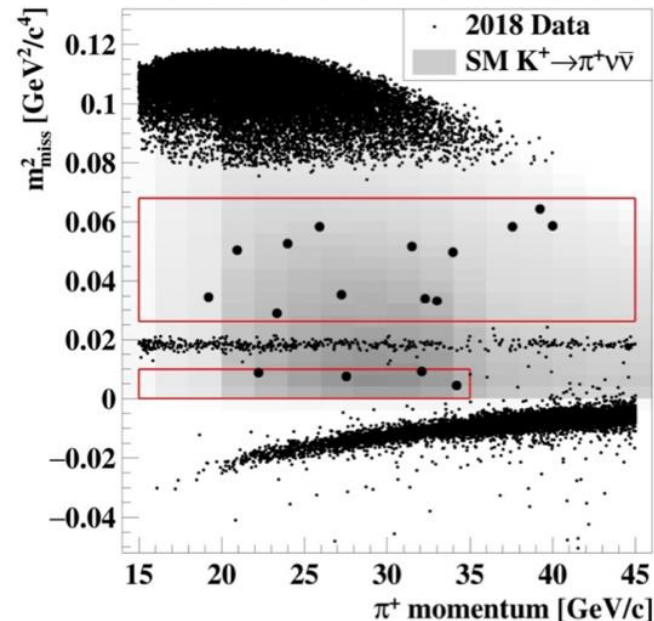


NA62 rare kaon decays



Year	Candidates
2016	1
2017	2
2018	17

$$\text{BR}(K^+ \rightarrow \pi^+ \nu \bar{\nu}) = (10.6_{-3.4}^{+4.0} |_{\text{stat}} \pm 0.9_{\text{sys}}) \times 10^{-11} \text{ at } 68\% \text{ CL}$$



arXiv.org > hep-ex > arXiv:2103.15389

Search...

Help | Advan

High Energy Physics – Experiment

[Submitted on 29 Mar 2021 (v1), last revised 5 Jul 2021 (this version, v2)]

Measurement of the very rare $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay

NA62 Collaboration

The NA62 experiment reports the branching ratio measurement $\text{BR}(K^+ \rightarrow \pi^+ \nu \bar{\nu}) = (10.6_{-3.4}^{+4.0} |_{\text{stat}} \pm 0.9_{\text{sys}}) \times 10^{-11}$ at 68% CL, based on the observation of 20 signal candidates with an expected background of 7.0 events from the total data sample collected at the CERN SPS during 2016–2018. This provides evidence for the very rare $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay, observed with a significance of 3.4σ . The experiment achieves a single event sensitivity of $(0.839 \pm 0.054) \times 10^{-11}$, corresponding to 10.0 events assuming the Standard Model branching ratio of $(8.4 \pm 1.0) \times 10^{-11}$. This measurement is also used to set limits on $\text{BR}(K^+ \rightarrow \pi^+ X)$, where X is a scalar or pseudo-scalar particle. Details are given of the analysis of the 2018 data sample, which corresponds to about 80% of the total data sample.

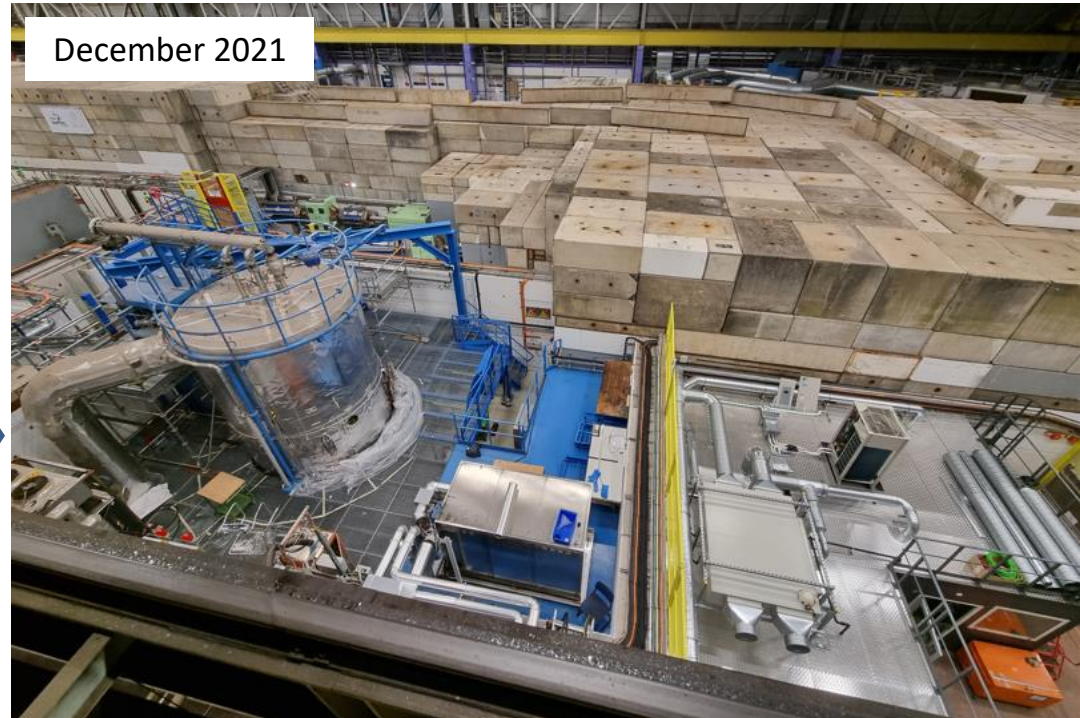
EP-DT CLOUD activities 2021



- **Massive** dismantling, modification and re-construction of CLOUD as part of the PS East Area renovation project.
- EP-DT in key roles:
 - EP-DT-FS: Gas system completely rebuilt;
 - EP-DT-DI: Slow control system completely rebuilt;
 - EP-DT-CO: Technical and resource coordination; New Control room, Platforms, Electricity, IT network and HVAC (execution by EN, SCE and IT); Thermal system modifications; New Beam counters.
- **Target:** Ready for first run in April 2022.



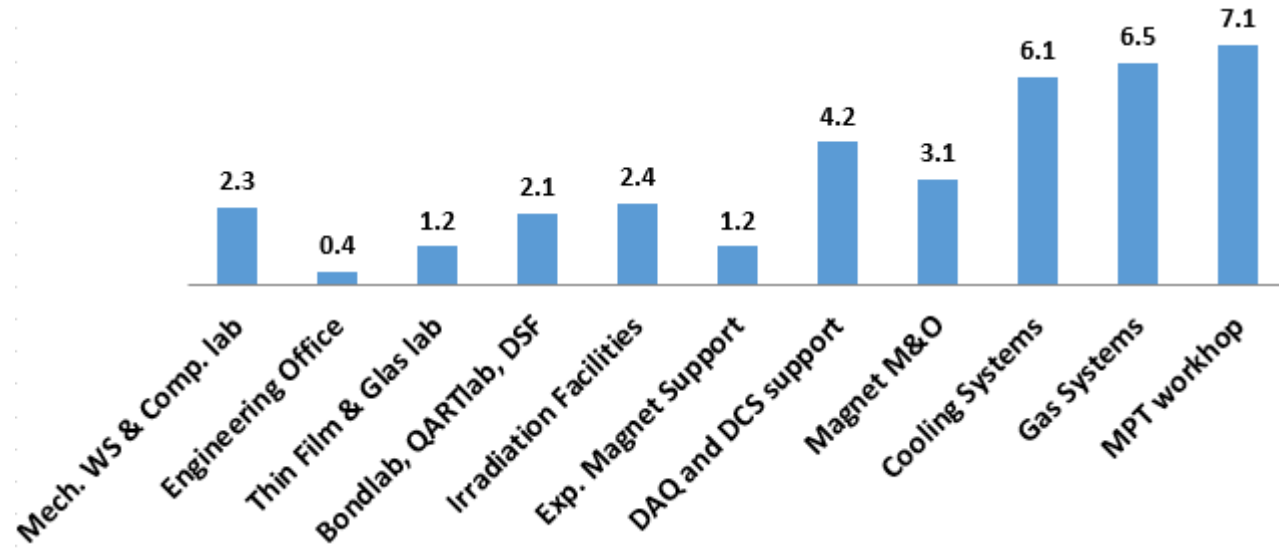
April 2020



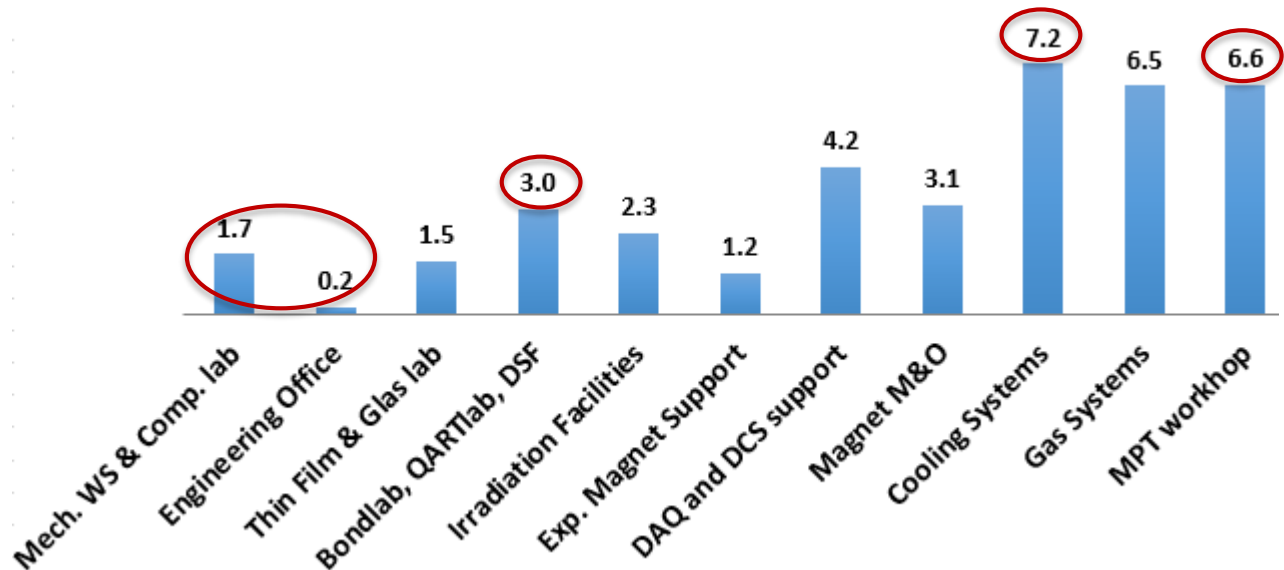
December 2021

DT Staff involvement in Services

2021 (real)



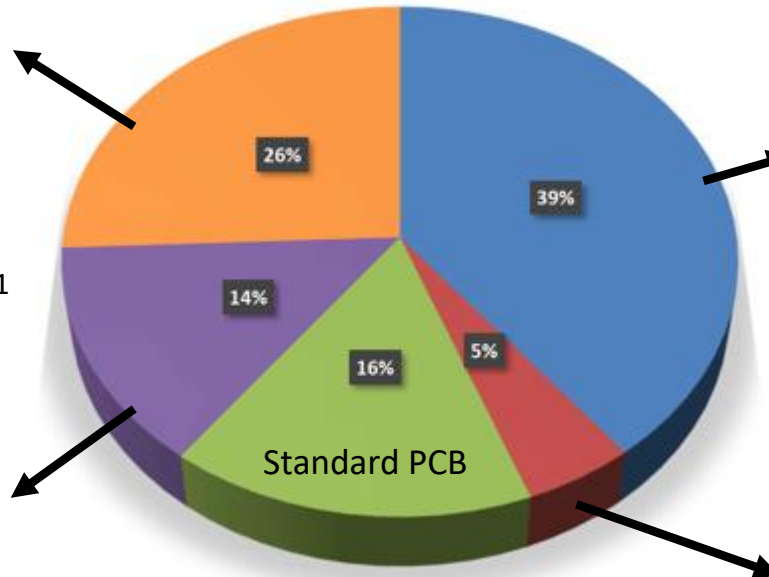
2022 (planned)



MPT workshop 2021/2022



Team of 20 persons (incl. FSU)
Approximately 200 jobs
4 examples:



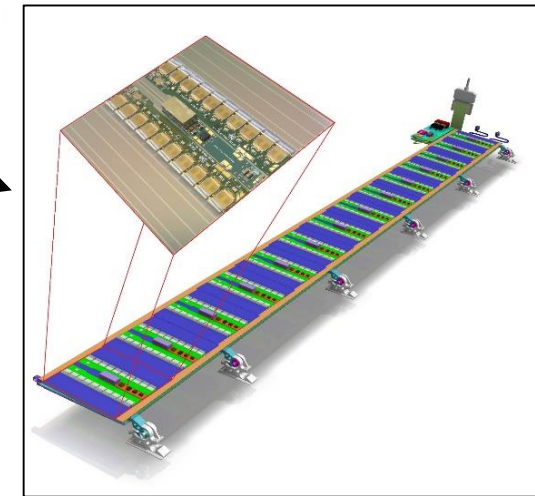
T2K upgrade
Resistive Micromegas detectors (32)
8 done in 2021

CMS GE2.1 first test module installation
450 GEM 1.2m x 0.5m → 30% done in 2021

Spare part for the Alice TPC
150 GEM 1m x 0.5m → 50% done in 2021



Quench heater for LHC
Different flavors , up to 9m long
More than 50 produced in 2021



ATLAS ITK inner tracker long buses
1.4m x 15cm
36 pieces produced in 2021

Projects for 2022

- ATLAS ITk Flex production
- CMS GE2.1 production
- Alice TPC GEM spares
- T2K Micromegas
- DUNE single phase readout
- Start of EIC program
- Intense R&D program

Building 140 and EP-DT Cluster

BUILDING 140 WORKING GROUP

Composition	Name
Working Group chair	Kathy Pommès
EP/AGS-SI Coordination Works representative	Sébastien Auerbach
Experiment's representatives	Carlos Solans (ATLAS)
	Dave Barney (CMS)
EP/DT representatives	Neil Dixon
	Frédéric Merlet
EP Safety representative	Evelyne Dho
SCE representative	Vincent Ricodeau
Resource coordinator	Véronique Nazical
Administrative support	Julia Cachet

THE FOLLOWING SLIDES ARE OF KATHY POMMÈS, EP RETREAT



Chronology of the Project

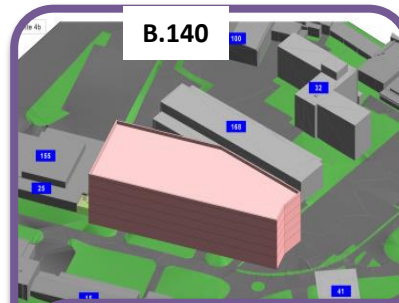


2012

Total surface area : 18'500 m2
Estimated 60 MCHF

Program

EP Management & Community, EP-DT

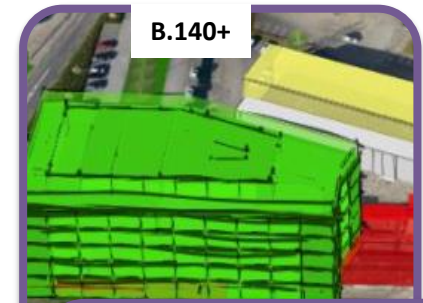


2020 – Mid 2021

Total surface area : 15'000 m2
Estimated 50 MCHF

Program

EP Management & Community,
EP-DT



Mid 2021 -

Total surface area : 18'000 m2
Estimated 85 MCHF

Program

Learning Center (HR, HSE & IR)
IR Host State, Educ., Com. & Outreach
DG Council chamber, Foyer
EP Management & Community, EP-DT

Scenarios considered for the relocation of EP-DT

CMS Tracker & Fine Mechanics WS

B164 531 m2/545 m2 B108
WS for Fluidic Systems

- Clustering
- Space extension
- Long term Investment
- Impact controlled on activities

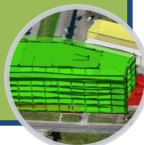
Work in progress
Permanent
1.5 MCHF

Cluster B164/B108

B222 618 m2 B510
CMS Tracker FM WS

- Clustering
- Space extension (bat 140+)
- Long term Investment (Partially B.222)
- Impact controlled on activities


Temporary
1.2 MCHF



B510 896 m2 B510
CMS Tracker FM WS

- Clustering
- Space extension (bat 140+)
- Long term Investment
- Impact controlled on activities

Temporary
1.5 MCHF



B162 694 m2 B162/169
CMS Tracker FM WS

- Clustering
- Space extension
- Long term Investment
- Impact controlled on activities

Permanent
Amount under study

Cluster B162/B169 B16/B17

Status:

- Discussion about the relocation of our activities in buildings 25/70/166/187 are ongoing
- We are positive about a recent proposal to move the activities to buildings 16/17/162/169, provided the space needs are adequately met and that the renovation of the complex is carried out before the move of DT.
- **Until then, the DT cluster should stay where it is now.**
- Should the recent proposal materialize and become a permanent solution for EP-DT, it would reduce the request of space for EP-DT in building 140+.

Concluding remarks

- DT makes important contributions to LHC and SME experiments
- The collaboration with the teams of the experiments is very good
- We have lost the flexibility to react to unforeseen events, where support is desired from DT, and can only help with FSUs (money).
- We lack human resources to fulfill the commitments to the Phase 2 Tracker upgrades and try to find solutions with the experiments.
- Building 140+ will cause additional delays for the realization of the Phase 2 Tracker upgrades and remains a mayor concern.
- The age-profile of persons on permanent contracts is a concern as 30% of the staff will retire before the end of the decade.
- We are addressing this issue together with the EP management.

