



HL-LHC CM # 8 closing remarks

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CERN – 18 October 2018



**THANKS to many people
for the banquet in SM18/SMA18
of TE/VSC and TE/MSC and Safety teams and...
to Patricya and Elodie (not forgetting Celine)
and to
Cecile!!!**



Goal of HL-LHC as fixed in 2010

From FP7 HiLumi LHC Design Study application

The main objective of HiLumi LHC Design Study is to determine a hardware configuration and a set of beam parameters that will allow the LHC to reach the following targets:

A peak luminosity of $L_{\text{peak}} = 5 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$ **with levelling**, allowing:

An integrated luminosity of **250 fb⁻¹ per year**, enabling the goal of $L_{\text{int}} = 3000 \text{ fb}^{-1}$ twelve years after the upgrade.

This luminosity is more than ten times the luminosity reach of the first 10 years of the LHC lifetime.

Ultimate performance established 2015-2016: with same hardware and same beam parameters: use of **engineering margins**:

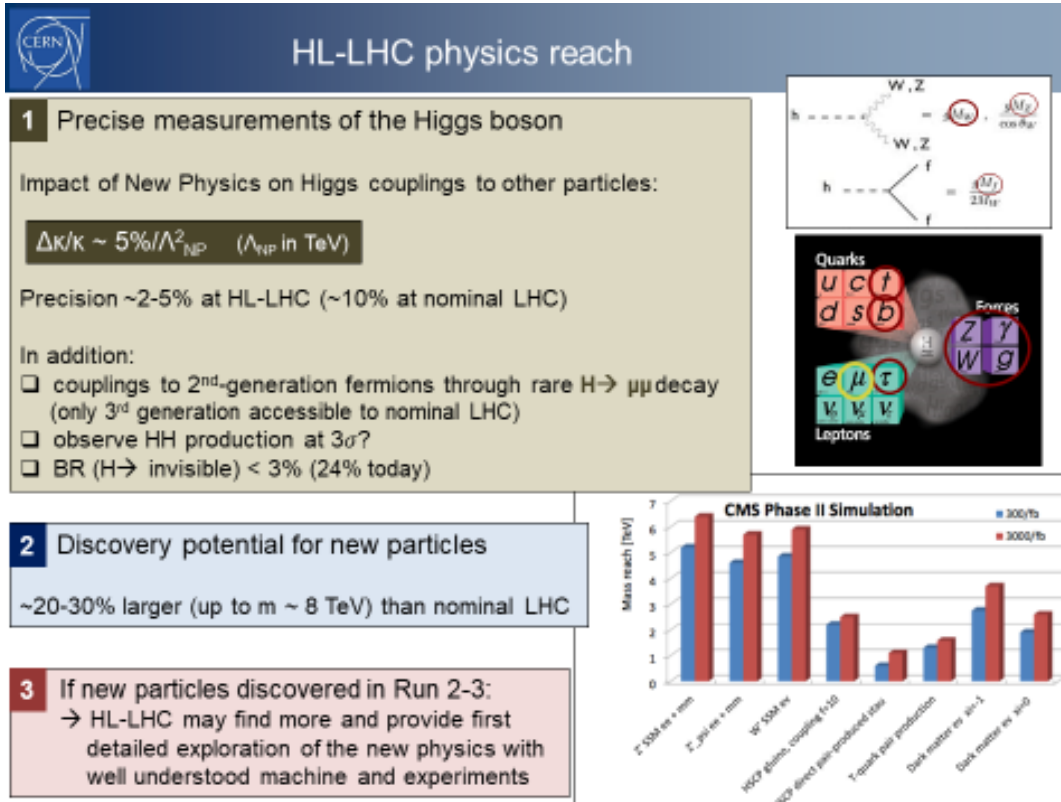
$L_{\text{peak ult}} \cong 7.5 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$ and **Ultimate Integrated** $L_{\text{int ult}} \sim 4000 \text{ fb}^{-1}$

LHC should not be the limit, would

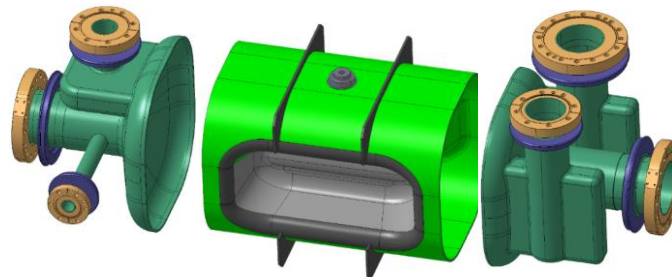
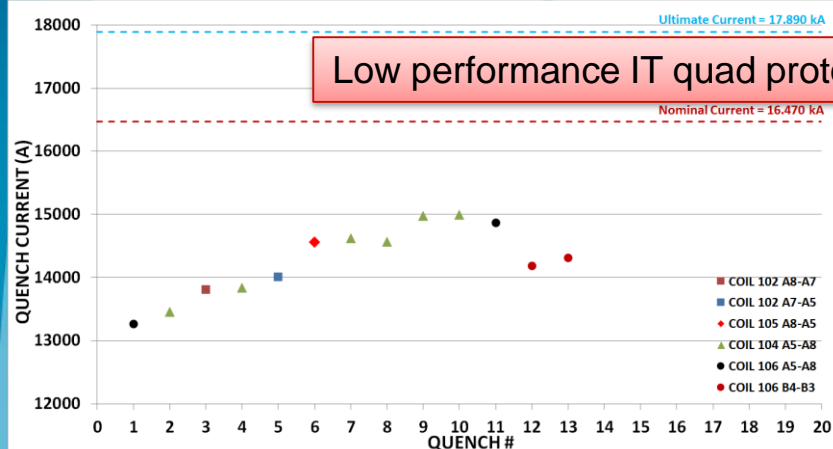
**Experiment are designing for this goal.
We need to be compatible with it!**

Then Physics of HL-LHC in one slide!

(by Fabiola Gianotti)



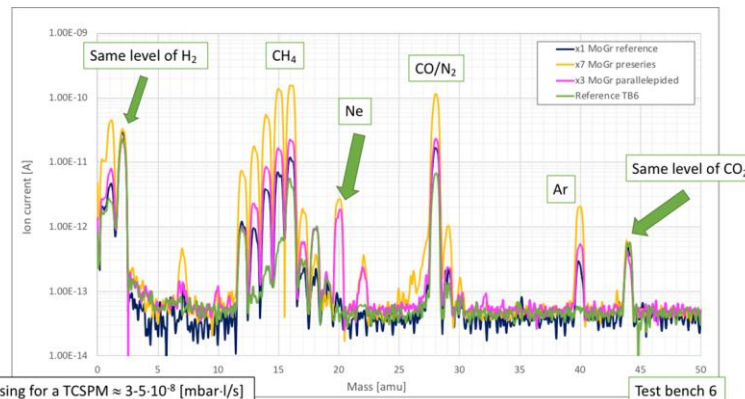
We are experiencing problems everywhere!



Some delay: will not be installed in LS2

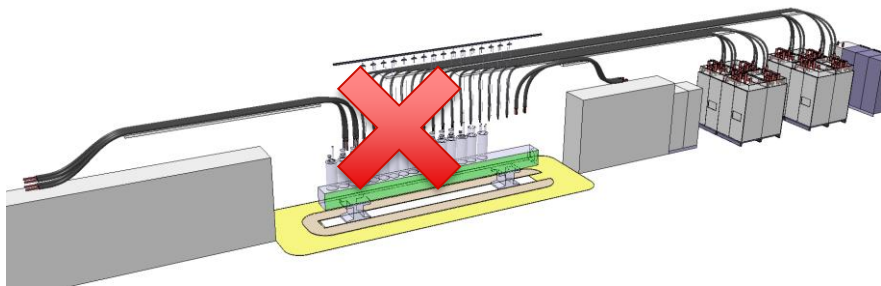


1st 11 T proto: damaged coil, low insulation QH after cold test



Low-Z collimator in MoGR: outgassing, coating issues

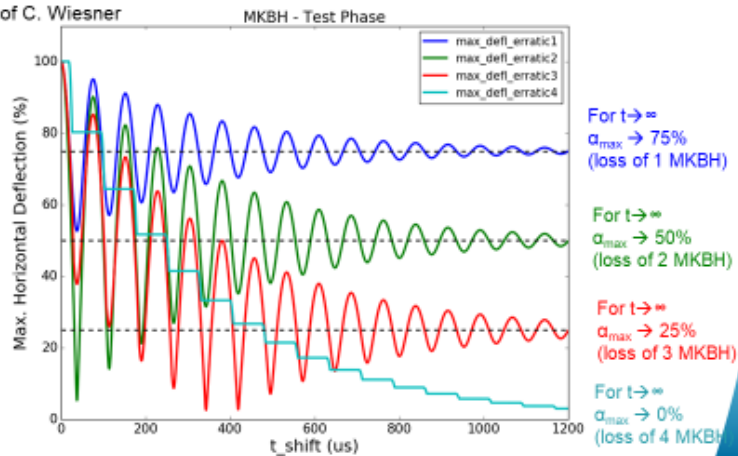
...new optimizations and issues requiring new equipment...



New Failure Case: EM Coupling

- New failure case: **parasitic EM coupling between MKB generators**
- Possible losing more than 50% of the horizontal dilution (in case of antiphase)

Courtesy of C. Wiesner

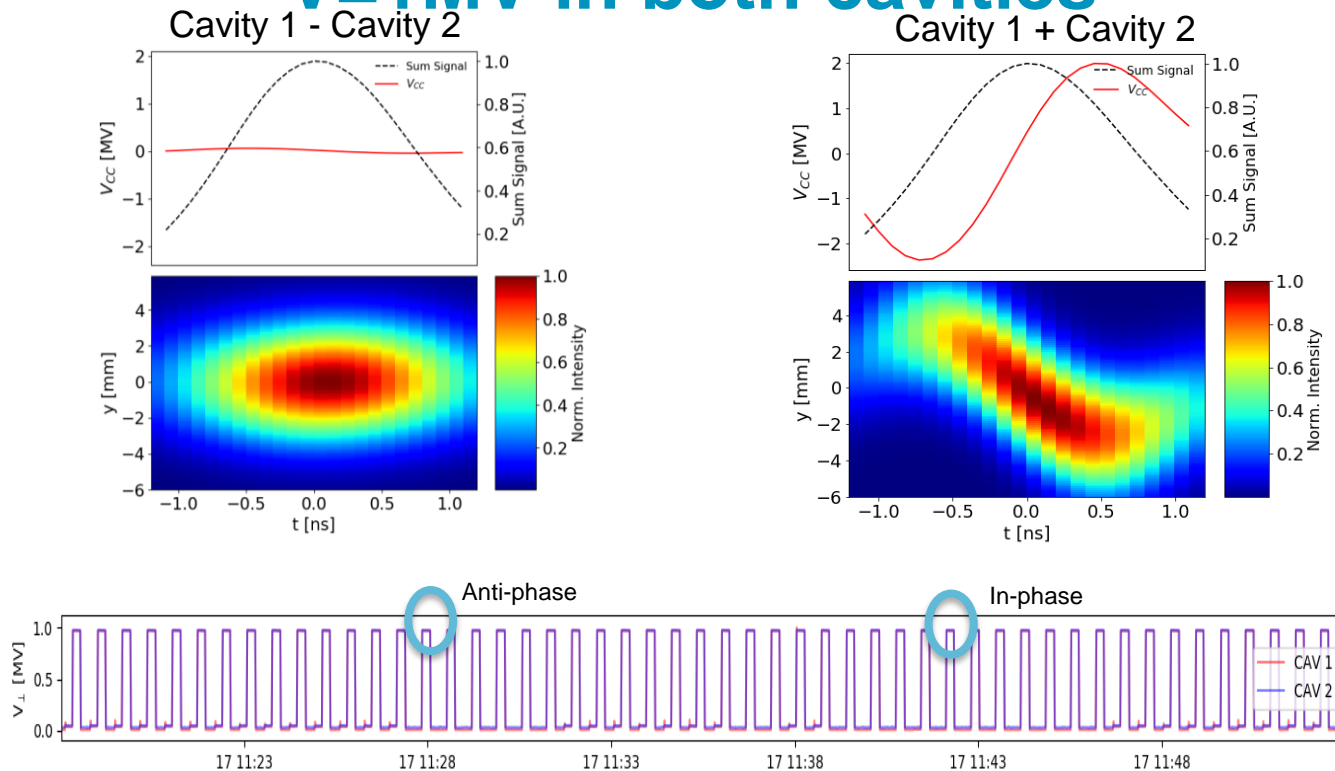


**But we continue to have favorable winds
thanks to good sailors**



Proof of CC Transparency on 17 OCT 2018!

$V=1\text{MV}$ in both cavities



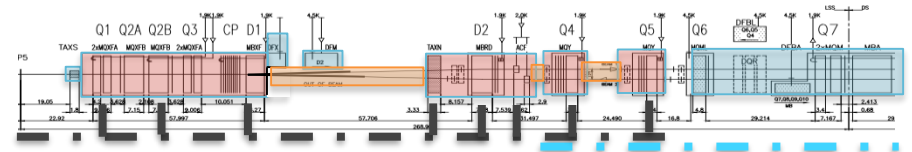
SC
Link =
60 m

Excellent results in cold powering, collimators, new layout...

Test of first large current SC links soon!



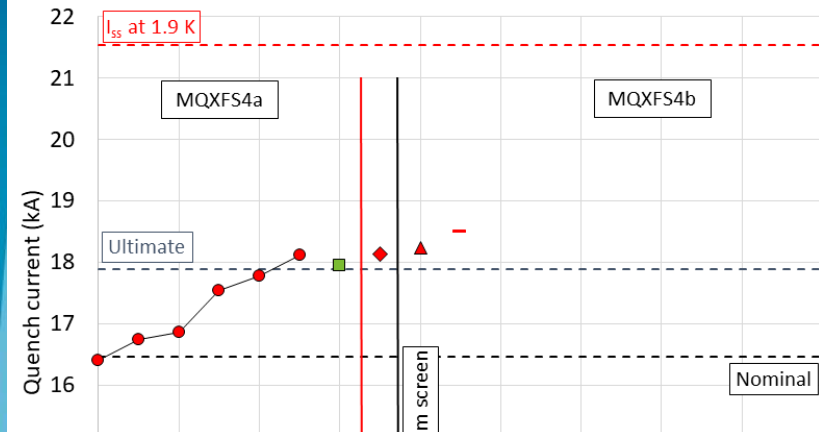
Validation of first TCLD (DS coll.) under way!



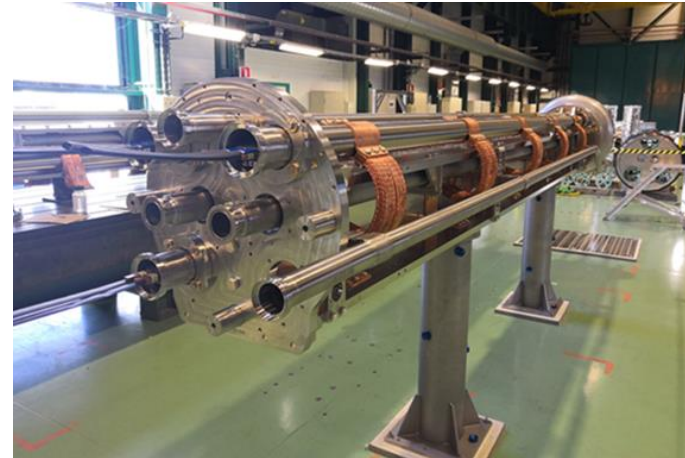
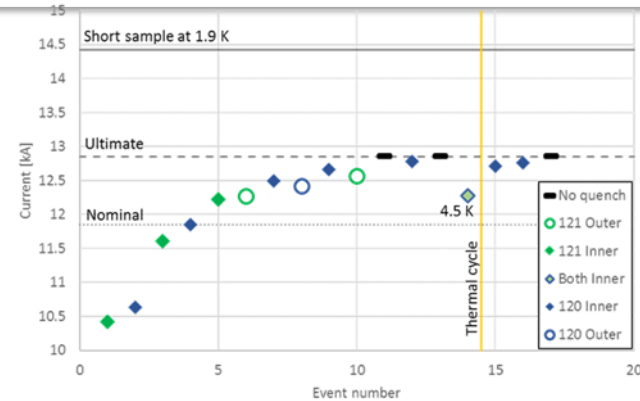
Full beam based Remote alignment and MS optimization!



Production of Nb₃Sn conductor almost half way!

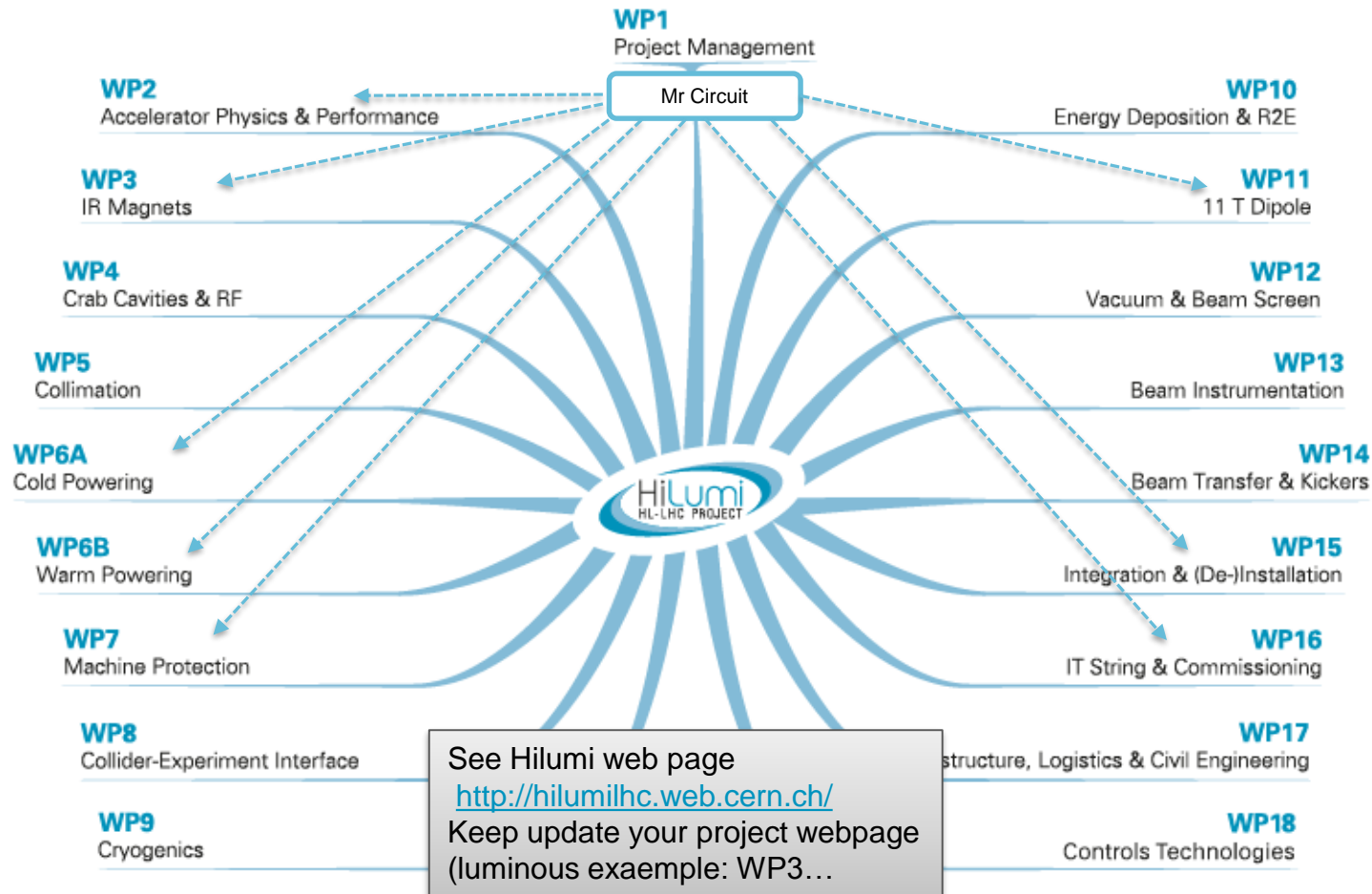


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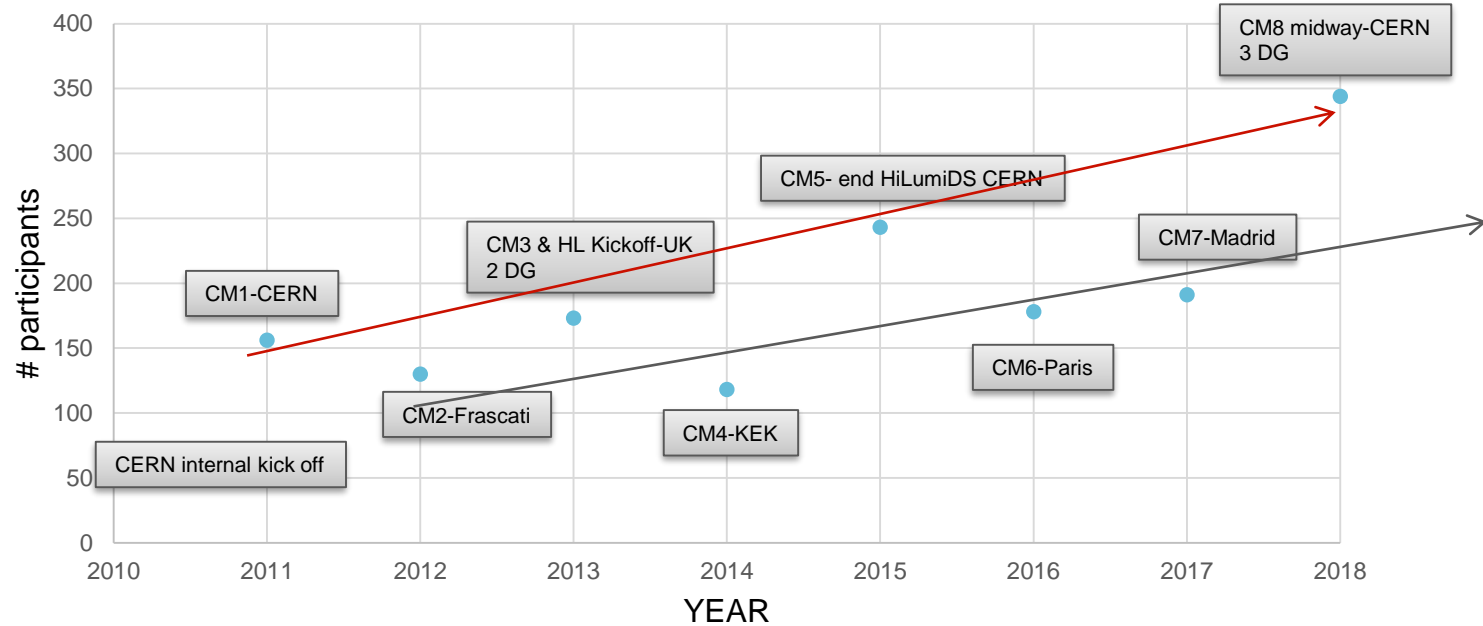
And more...

- Disconnectors and new distributed DFHs...
- TDIS under test
- Collider-Experiment interface ready to install...
- A-C coating robust and ready
- **LESS... may be a key element to beat e-cloud?**
- Cold diodes ready to be inserted...
- In-kind and options: e-lens, crystal collimation, MKE/Dump...
- And what about LRBBCW? May buy us a large territory and even larger performance... see talk of S. Fartoukh
- **INTEGRATION – INSTALLATION – RISK – ECR : Be attentive and responsive... we cannot put in danger the project for missing answer... Ask help**



Attendants HL CM vs years

HiLumi LHC CM participants



HL-LHC Collaboration Board

HL-LHC CB Chairs

2011 to 2015 (FP7-HiLumi)



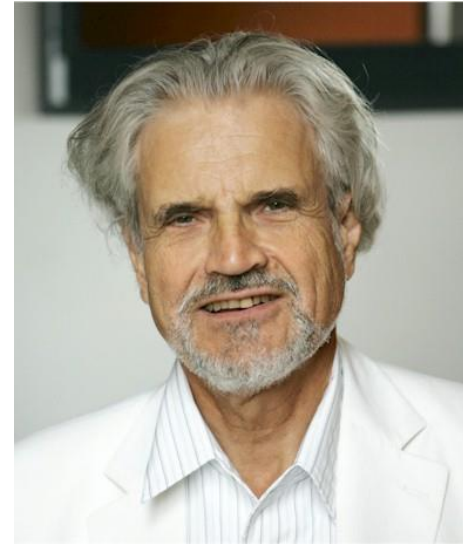
Andy Wolski (UNILIV)

2015 to 2018



Rob Appleby (UNIMAN)

Elected 2018



Tord Ekeloff (Uppsala U.)

All of us ...



All pictures on

<https://cds.cern.ch/record/2643666?ln=fr>

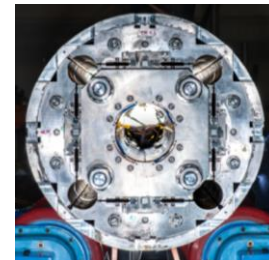
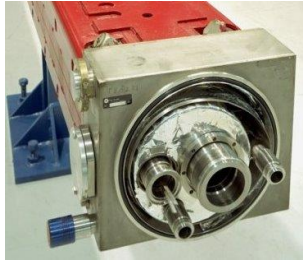
Send yours to Cecile and/or Isabel!!!!



Thanks Juan and all!



Where it all started



- FNAL will be delighted to host 9th the HL-LHC Collaboration Meeting
 - Oct 13th - 18th 2019



**A wholeheartedly
thank to Bruce!!!!
Chair of the IEEE-CSC**

**25 years spent to make a
bridge between USA and
CERN and a full career to
bridge Accelerators and
Superconductivity**