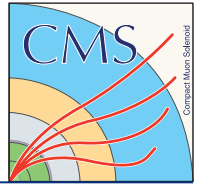# CMS 2018 Spokesperson election

Prof. Roberto Carlin
University of Padova and INFN
10.1.2018
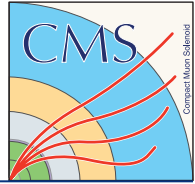
Outlook

- BIO
- Where we are
- The next years
- The role of the spokesperson

I'll try to be short, please interrupt for questions

BIO

- Professor of Physics at the University of Padova, Italy
  - Teaching from 1990 mostly General Physics to Engineers, and Particle Detectors to Physics students

- Long experience in large HEP collaborations
  - ZEUS from 1986 to 2005
    - Designed muon chambers, trigger electronics
    - Trigger coordinator of ZEUS for several years
    - Co-project manager for design and construction of silicon strips vertex detector in ZEUS/HERA upgrade
    - Deputy spokesperson of the collaboration before moving to CMS
  - CMS from 2006
    - DT chambers commissioning and first operations of CMS
    - Trigger coordinator from 2012 to 2015
   - Presently Deputy Spokesperson

CMS: a great success
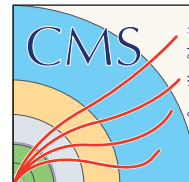
- CMS **took excellent data efficiently,** and **analysed it promptly,** despite of many challenges (PU, computing, phase 1 upgrades commissioning)
- We managed because we have
  - An excellent and very flexible detector, trigger, DAQ and computing system
  - A well tuned, innovative and performant online and offline software
  - A dedicated and talented collaboration committed to operations upgrades and to perform excellent analyses with wide scope of topics.
- Germany has a big role in all this
  - Tracker, Muons, Castor, Computing and obviously analyses

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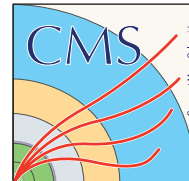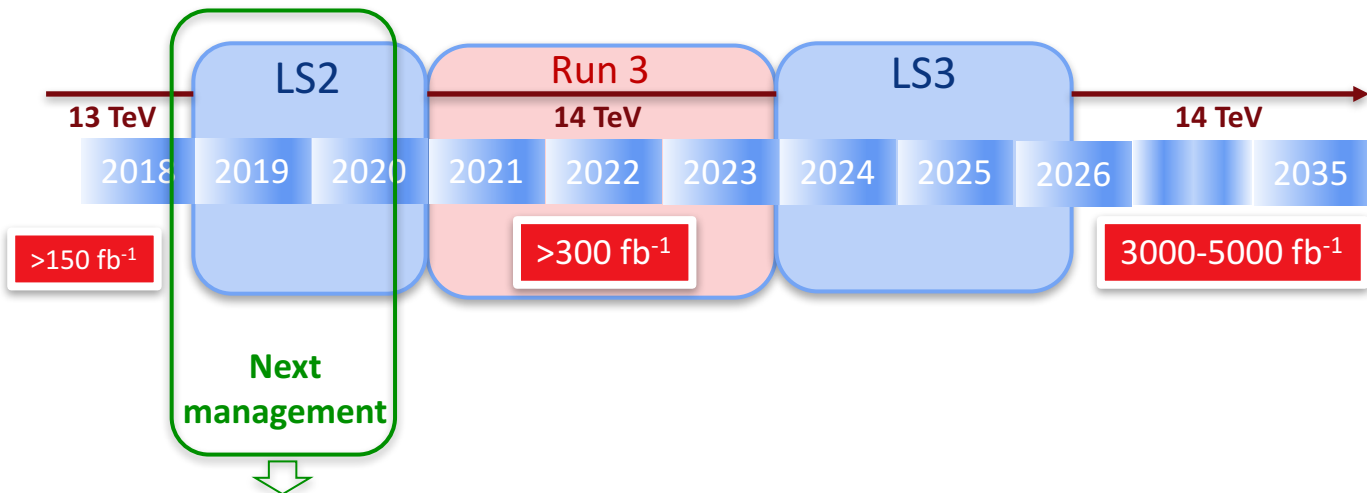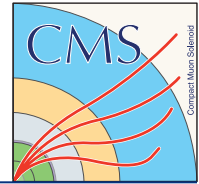
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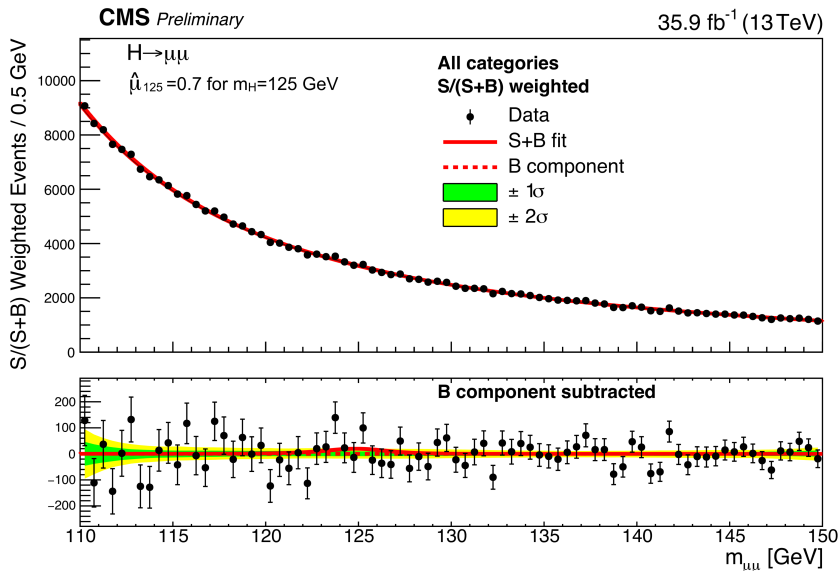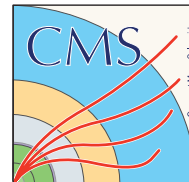
What about the coming years

- **Analyse 2018 and the full 13 TeV dataset**
- LS2: complete Phase 1 upgrades (mainly Hcal) and replace Layer 1 of the pixel detector (and more), begin HL_LHC upgrades (GE11, infrastructure, …)
- Prepare Run 3 (trigger, operations, MC, physics plans)
- Proceed swiftly with HL-LHC upgrades

Task PU in the coming years

Calendar Year		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Long Shutdowns					LS2						LS3	
Tracker:	Outer	Design - Demo.	TDR	Engineering - Prototyping		EDR	Pre-production - Production - Integration - Commissioing				Inst. - Comm.	
	Pixel			Engineering - Prototyping			EDR	Pre-production - Production - Integration - Commissioing			Inst. - Comm.	
Barrel Calo.	ECAL	Design - Demo.	TDR	Engineering - Prototyping		EDR	ESR	Pre-production - Production		Integration - Installation - Commission		
	HCAL			Engineering - Prototyping			EDR	Pre-production - Production		Installation - Commissioning		
End cap Calorimeter		Design - Demo.	TDR	Engineering - Prototyping		EDR	End cap 1: Pre-production - Production - Integration - Commissioning			Inst. - Comm.		
							End cap 2: Pre-production - Production - Integration - Commissioning			Inst. - Comm.		
Muons:	GEM1	Engin.	EDR	Production	Inst.							
	CSC	FE Engin.		Pre-pro	ESR	Production	FE Inst.	BE Engin. - Pre-prod.	ESR	BE Production	BE Inst. - Comm.	
	DT			Engineering - Prototyping	Pre-pro	EDR	Prodcution			Installation - Commissioning		
	RPC	Design - Demo.	TDR	Engin. - Proto.	EDR	Pre-pro	ESR	End cap 1: Production	Inst.			
								End cap 2: Production	Inst.			
								Pre-pro. ESR Barrel Link System: Production	Inst.			
	GEM2	Design - Demo.		Engin. - Proto.	EDR	Pre-pro	ESR	End cap 1: Production	Inst.			
								End cap 2: Production	Inst.			
	GEM0	Design - Demo.		Engin. - Prototyping			ESR	Pre-pro	EDR	Production	Inst. - Comm.	
MIP-Timing	Barrel	Design - Demo.	TP	TDR	Engin. - Proto.	EDR	Pre-prod. - Prod. - Int. in Tracker - Comm.			Inst. - Comm.		
	End cap				Engin. - Proto.		EDR	Pre-production - Production - Integration - Commissioing			Inst. - Comm.	
L1-Trigger		Conceptual Design	ITDR	Design - Proto. - Demo.		TDR	Pre-production	ESR	Production		Installation - Comm.	
DAQ/HLT		Design	ITDR	Electronics Proto. - Demo. V1			TDR	Pre-pro - Demo. V2	ESR	Electronics production - Slice	Installation - Comm.	

Next management

Run 3

HL-LHC: intense prototyping, pre-production, EDRs (and still 2 TDRs)

Very busy on many fronts
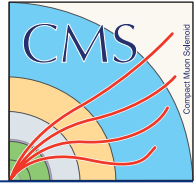
- Need to keep the collaboration focused on several different topics and timescales
  - Essential **to plan at all timescales**
    - To be able to engage all the resources and enlarge them, including remote and new institutions
    - And to spread tasks and reducing peaks
  - Optimize operations with modern techniques wherever possible.
- **Institutional commitments (not "service" tasks) essential to:**
  - guarantee long term coverage, helping institutes to plan activities, stimulate interest in innovation and quality
  - Clustering between large/old and smaller/new institutions have proven successful and should be pursued further
- SP will need to put efforts and incentives and possibly use a dedicated task force

LS2

- Intense upgrade plan (Pixel Layer 1 and not only, HCAL, GEM, infrastructure)

- Advance the preparation for Run-3, by introducing optimizations and improvements (also backporting from phase2), to keep the interest and the focus, and to train new experts

- Plan analyses, trigger, calibrations, offline, computing for the integrated three years of Run-3

    - Will need high quality objects for high precision analyses with several detector will come close to their planned integrated dose life time.

Phase 2

- We are building a new, innovative and challenging CMS
  - Tracker with L1 trigger, 4 dimension reconstruction with timing etc.
- Germany strongly involved in inner/outer tracker, muons
- Large manpower needs in all coming years
  - The management need to work with projects and funding agencies to make sure all institutions worldwide are involved and fully engaged at all levels with rich and appealing programs.
- Need continuous internal review by the upgrade coordination and the management on the availability and use of resources, and continuous report to the collaboration on the status and needs
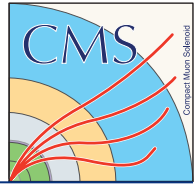
Phase 2

- We need a strong effort to ramp-up quickly after TDR approvals, analysing the lessons from the recent past:
  - Need extensive system tests, and time to do it. Do not slip milestones and do not take shortcuts
  - Test as much as possible with integrated system in conditions as close as possible to final
 - Review thoroughly any change

Phase 2
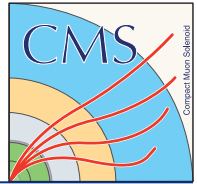
- To do this we need a strong Upgrade Coordination office, that works very closely to the projects and coordination area

- Help in finding synergies, monitor milestones, identify and address problems, prepare internal and external reviews

  - Synergies can be found for example in electronics, firmware, trigger, DAQ. But need to be established from the beginning

Emergency handling

- Planning can minimise but not remove short term needs/emergencies.
    - Typical examples are unexpected changes of LHC operating mode
- Short term task forces, generated by the management and by the involved coordinators, have proven effective
    - Involving senior and young experts from the whole Collaboration

Analyses and publications
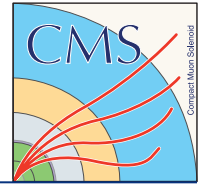
- We are entering an era of longer luminosity-doubling times that will have a profound impact on our analysis, conference and publication strategies, requiring longer term planning and sustained vision.
  - The transition is already happening, with less pressure on analysers on specific timelines (e.g. end-of-year Jamborees)
- But we must ensure that flagship analyses are well defined and supported by the Collaboration, and proceed timely.
  - Form advisory groups, discuss at MB and WGM, review frequently with the collaboration
  - With the Collaboration under stress for many manpower needs, we need to optimise the process, getting promptly to paper-ready results and then to quick publication.

ttH multilepton
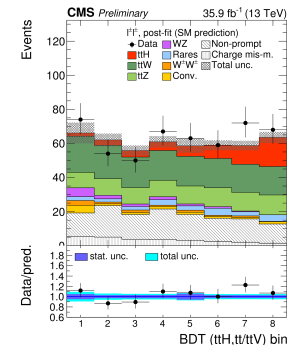
Analyses and publications

- Precision measurements:
    - Need state of the art object reconstruction, MC simulations and detector calibrations.
- Encouraging pursuit of novel investigations and innovation in analysis techniques to maximize our physics reach.
    - Again, start early in LS2 for Run 3 preparation
    - We must remain ready to respond to compelling new developments in theory or phenomenology.
- Discoveries may still be around the corner so we need to clarify our approach in case of unexpected signals
   - Inside CMS and with the other collaborations

Transparency

- The Collaboration needs to be involved and aware of the reasons of the decisions from management and coordinators
- Bottom-up flow of information helps understand the issues and their perception
  - Consult frequently MB advisors and regional representatives, CBIs and **young members**
  - Ask them to be proactive in contacting management (at all levels) and make proposals in case of problems
- Make sure the status and decisions are fully reported. Two main chains:
  - the WGM direct communications need to get more attractive, in particular for the young members
  - Management chain from L1 to L2s to all the many meetings
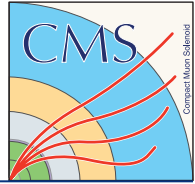
Role of the SP
(and of the Deputies)

- Main interface to external bodies: other experiments, CERN, funding agencies, external committees (LHCC, RRB) etc.
  - TC, Upgrade Coordination and all the other coordinators have also important contact roles, that need continuous sharing with the SP
- Coordinate the management of the experiment
  - Delegate to the layered structure, which needs to be proactive at all levels
  - Making sure of their cross-coordination, keeping a continuous overview to identify problems and suggest balancing and correcting actions

Role of the SP
(and of the Deputies)
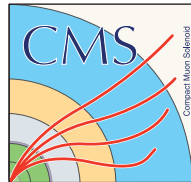
- Keep continuous interaction with the CB chair and the many CB committees

- Help promoting novel investigations and technical improvements to maintain CMS' position of scientific leadership

- Make sure that CMS will continue to provide a first-class, motivating and enjoyable research environment

  - Offering our young members many opportunities to grow, promoting new leadership from all institutions and countries. Make clear the paths to get into that.

  - Promoting diversity in all areas

BIO 2

- My experience, in particular the Trigger Coordination and my current role as Deputy SP, has given me a clear and comprehensive view of our experiment, its interaction with CERN and all external bodies, and its path forward.
- My personal expertise and specific experience is well-suited to the known challenges of the next two years.
- I am convinced that I can serve effectively as Spokesperson of CMS, meeting the challenges of the coming term. If elected, I will serve CMS to the best of my ability.
- To succeed I will need a strong team, encourage strong teamwork, and put focus on continuous engagement and support of the whole CMS Collaboration worldwide

Conclusions

Thanks for the attention

And for the opportunity to present my thoughts