Introduction to CMS

CMS, US CMS and the LPC

Dan Green

Fermilab

Outline

- LHC Accelerator
- CMS Installation and Commissioning
- CMS Organization
- Resources – CMS @ CERN
- US CMS – T1, T2
- US CMS LPC
- US CMS ROC

Purpose/Overview of Course

Thursday 19 June 2008 top

09:30	CMSSW - General Overview of Architecture (30')	Elizabeth Sexton-Kennedy (*FNAL*)
10:00	CMSSW - Python Configuration (30')	Rick Wilkinson (*CalTech*)
10:30	Coffie Break	
10:45	CMSSW - PAT Introduction/Candidate Model (30')	Salvatore Rappoccio
11:15	CMSSW - Starter Kit (30')	Salvatore Rappoccio
11:45	LUNCH Break	
13:00	Advanced PAT Tutorial (30')	
13:30	Development Tools / Code Walk Through (2h00')	
15:30	CMSSW - Hands on Session (1h30')	

Friday 20 June 2008 top

09:30	Introduction to the CMS Computing Model (30')	Liz Sexton-Kennedy (*FNAL*)
10:00	Introduction to CRAB (30')	Eric Vaandering (*Fermilab*)
10:30	Coffie Break	
10:45	Introduction to data discovery - DBS (30')	TBN
11:15	User Experience with CMSSW and WF/DM Tools (30')	TBN
11:45	LUNCH Break	
13:00	CRAB - Hands on Session (3h00')	Eric Vaandering (*Fermilab*)

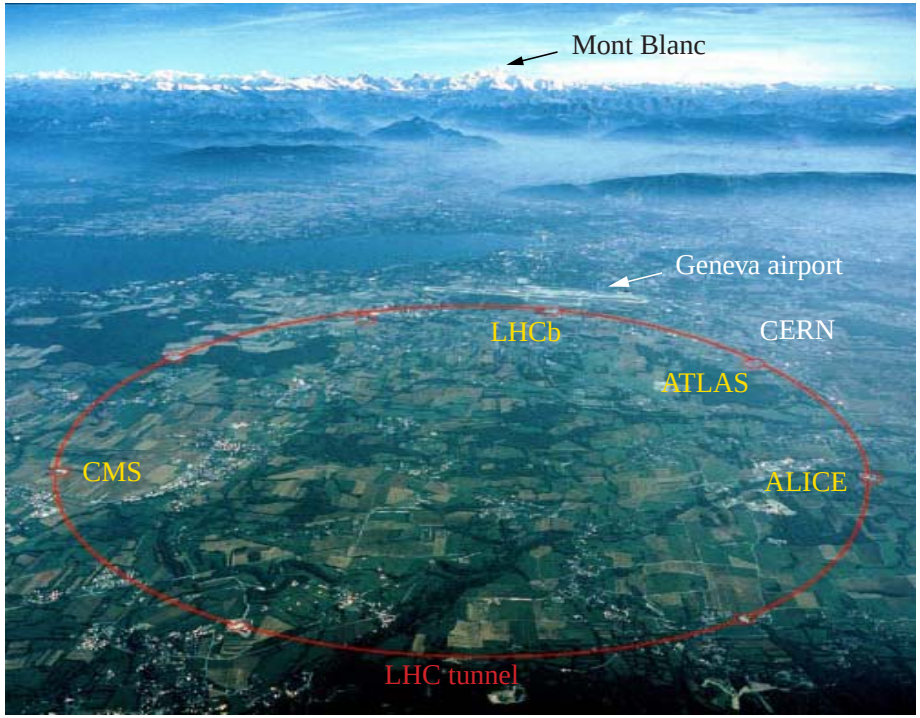
- Learn enough CMS jargon to understand many CMS week talks
- Learn who's who in CMS and what resources are available
- Establish that the LPC is a good place to go for resources in doing CMS research – and try some hands on work……

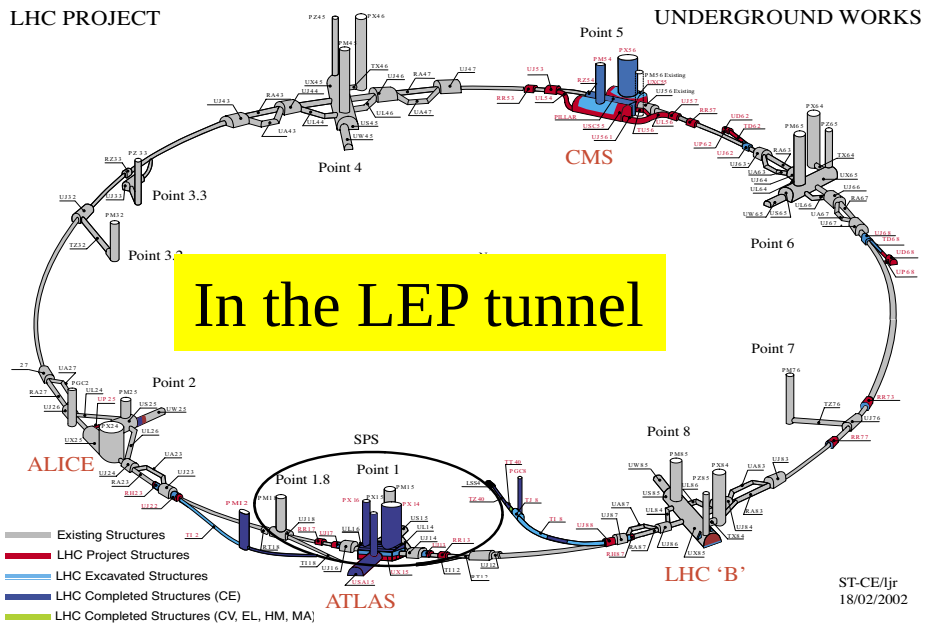
The LHC Accelerator

LHC is a discovery machine – starting to run in 2008!

First time in 25 years that a discovery machine has started up without crisp theoretical guidance

The Accelerator





- pp $\sqrt{s}$ =14 TeV L=10^{34} cm^{-2} s^{-1}=10 mb^{-1}MHz
- crossing rate 40 MHz
- Heavy ions (1 month/year)

http://lhc-new-homepage.web.cern.ch/lhc-new-homepage/

Comparison to Tevatron

LHC

beams: pp

$\sqrt{s} = 14$ GeV

crossing time: 25 ns

interaction region sigma is 5 cm

Design Luminosity: $10^{34} cm^{-2} s^{-1}$

$< \bar{n} >= 17$

Tevatron

beams: $p\bar{p}$

$\sqrt{s} = 1.96$ TeV

crossing time = 396 ns

interaction region sigma is about 28 cm

luminosity = $2\ 10^{32}\ cm^{-2} s^{-1}$

$< \bar{n} >= 5$

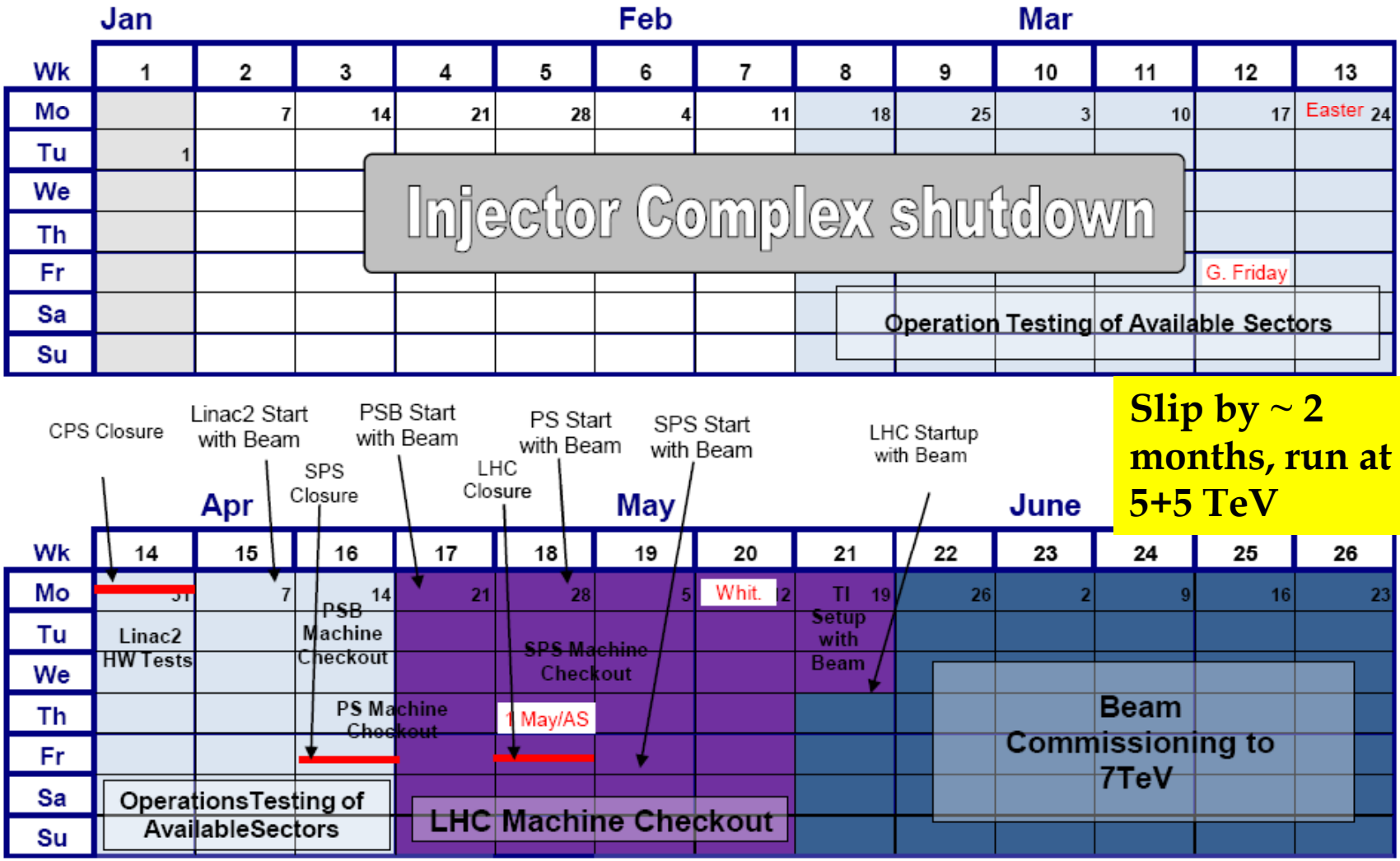
Schedule

LEP tunnel was designed with the idea of running protons, but the “date” for this running was first proposed around 1991.

First Beams:
“Late Summer”
2008
Then Physics

Less than a few months to turn-on!

2008 LHC Schedule



Slip by ~ 2 months, run at 5+5 TeV

Pileup? 75 ns, 25 ns

Parameters			Beam levels		Rates in 1 and 5		Rates in 2 (and 8)	
k_b	N	β* 1,5 (m)	I_{beam} proton	E_{beam} (MJ)	Luminosity ($cm^{-2}s^{-1}$)	Events/ crossing	Luminosity ($cm^{-2}s^{-1}$)	Events/ crossing
43	$4\ 10^{10}$	11	$1.7\ 10^{12}$	2	$1.1\ 10^{30}$	<< 1	$1.2\ 10^{30}$	0.15
43	$4\ 10^{10}$	2	$1.7\ 10^{12}$	2	$6.1\ 10^{30}$	0.76	$1.2\ 10^{30}$	0.15
156	$4\ 10^{10}$	2	$6.2\ 10^{12}$	7	$2.2\ 10^{31}$	0.76	$4.4\ 10^{30}$	0.15
156	$9\ 10^{10}$	2	$1.4\ 10^{13}$	16	$1.1\ 10^{32}$	3.9	$2.2\ 10^{31}$	0.77
936	$4\ 10^{10}$	11	$3.7\ 10^{13}$	42	$2.4\ 10^{31}$	<< 1	$2.6\ 10^{31}$	0.15
936	$4\ 10^{10}$	2	$3.7\ 10^{13}$	42	$1.3\ 10^{32}$	0.73	$2.6\ 10^{31}$	0.15
936	$6\ 10^{10}$	2	$5.6\ 10^{13}$	63	$2.9\ 10^{32}$	1.6	$6.0\ 10^{31}$	0.34
936	$9\ 10^{10}$	1	$8.4\ 10^{13}$	94	$1.2\ 10^{33}$	7	$1.3\ 10^{32}$	0.76
2808	$4\ 10^{10}$	11	$1.1\ 10^{14}$	126	$7.2\ 10^{31}$	<< 1	$7.9\ 10^{31}$	0.15
2808	$4\ 10^{10}$	2	$1.1\ 10^{14}$	126	$3.8\ 10^{32}$	0.72	$7.9\ 10^{31}$	0.15
2808	$5\ 10^{10}$	1	$1.4\ 10^{14}$	157	$1.1\ 10^{33}$	2.1	$1.2\ 10^{32}$	0.24
2808	$5\ 10^{10}$	0.55	$1.4\ 10^{14}$	157	$1.9\ 10^{33}$	3.6	$1.2\ 10^{32}$	0.24

Startup

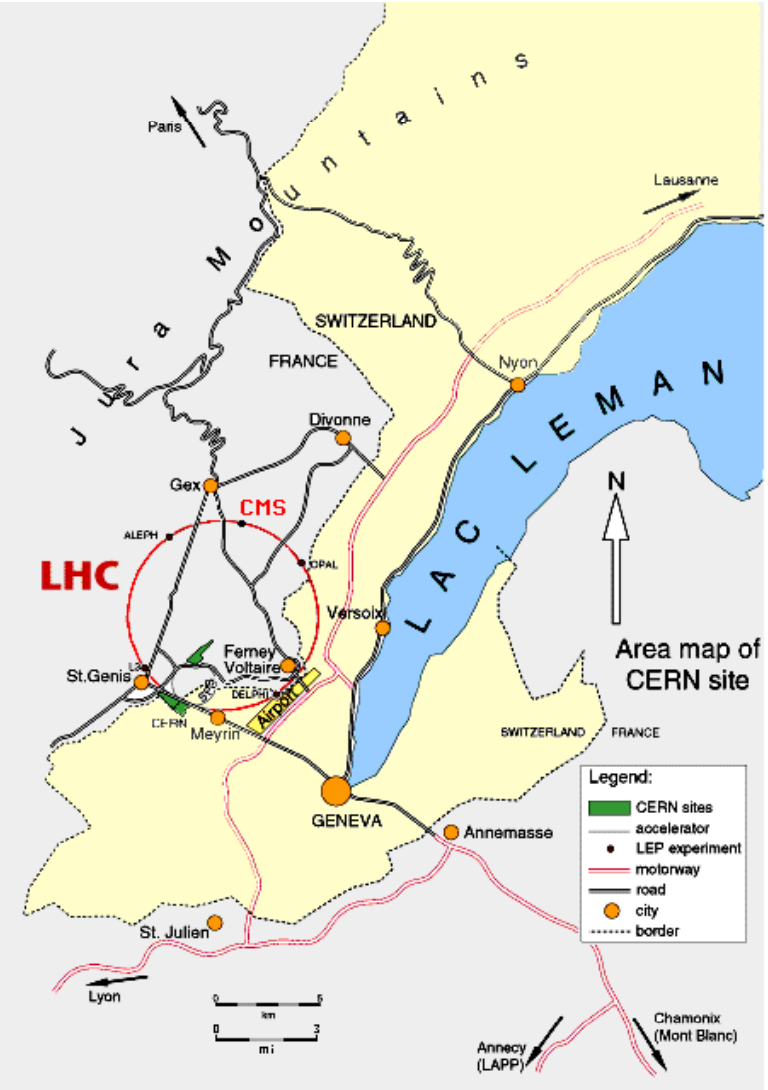
Phase - 2008

75

Nsec

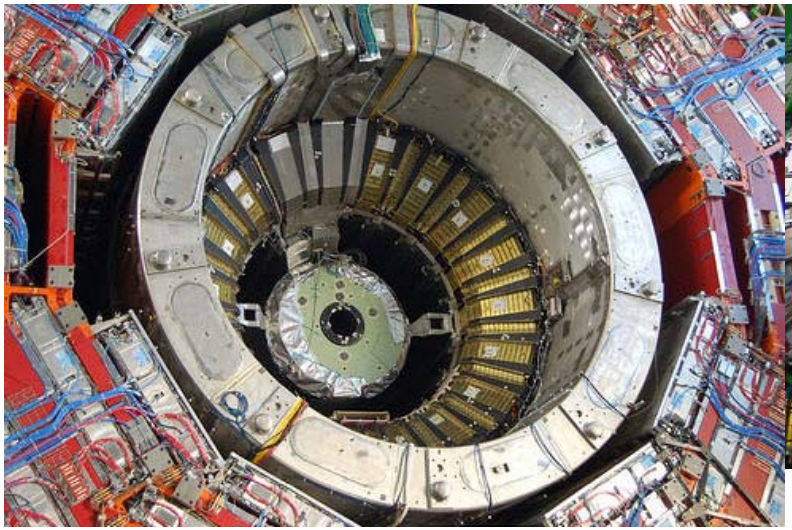
"Startup" at 10^30 – 2 MJ. Rise to 10^32 (pileup) and 16 MJ. Then, in 2009, go to 75 ns at get to 10^33 (pileup). Beam energy ~ 100x Tevatron (1 MJ)

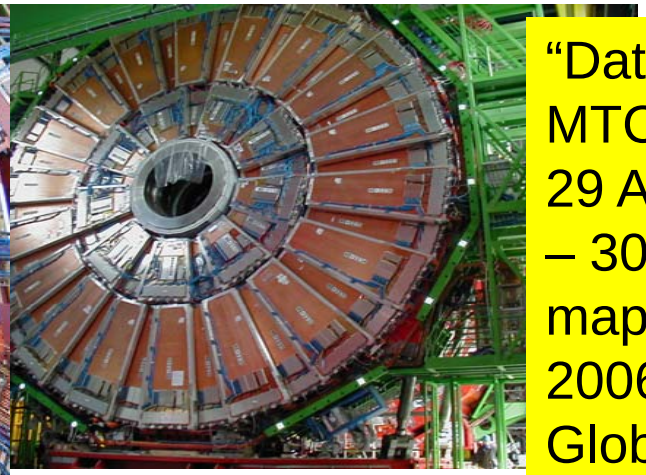
Where is CMS?



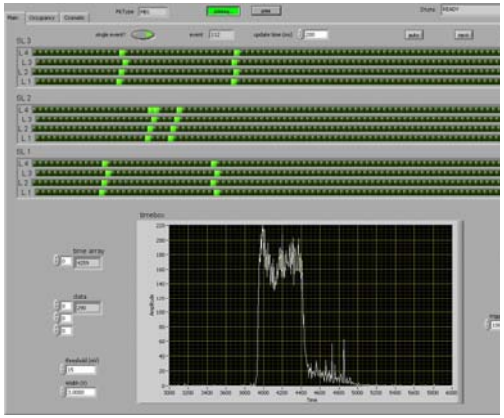
Need to cross the border to get from the cafeteria/building 40 to CMS. Carry your passport!

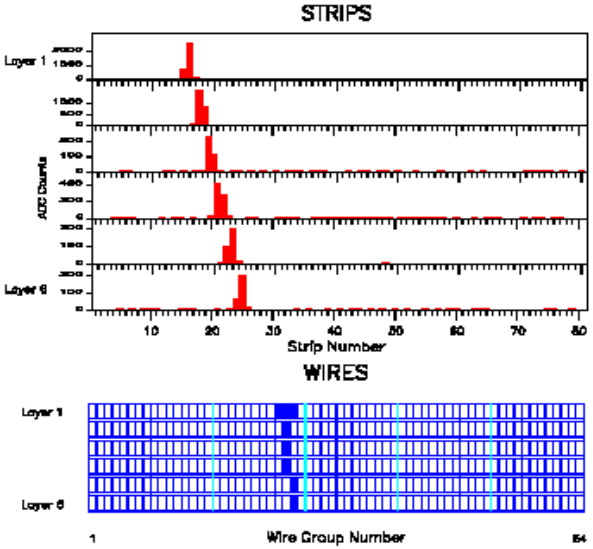
CMS is Taking Cosmic Data

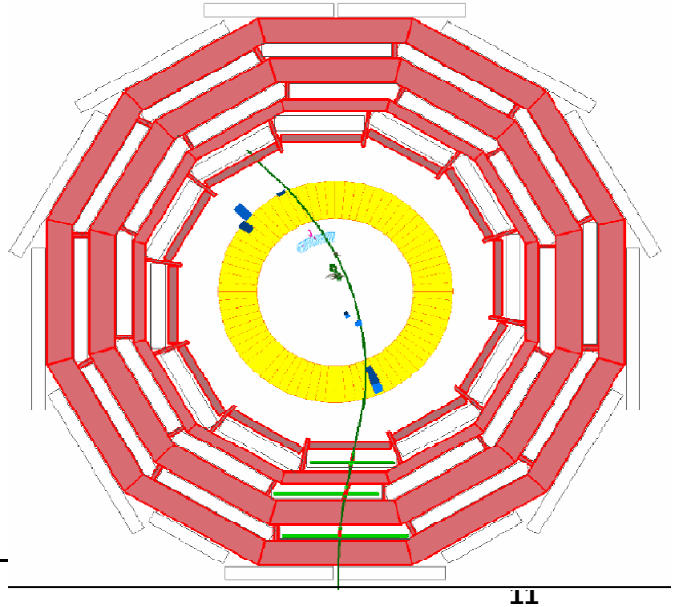




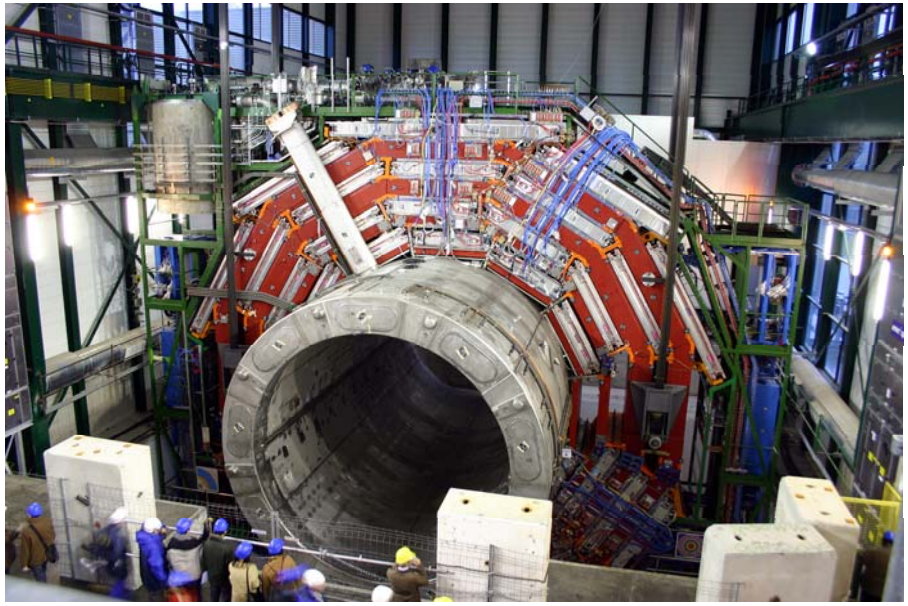
"Data"
MTCC I (24 Aug – 29 Aug) & II (9 Oct – 30 Oct). Field map done in Nov., 2006 in SX
Global runs in UX running now.

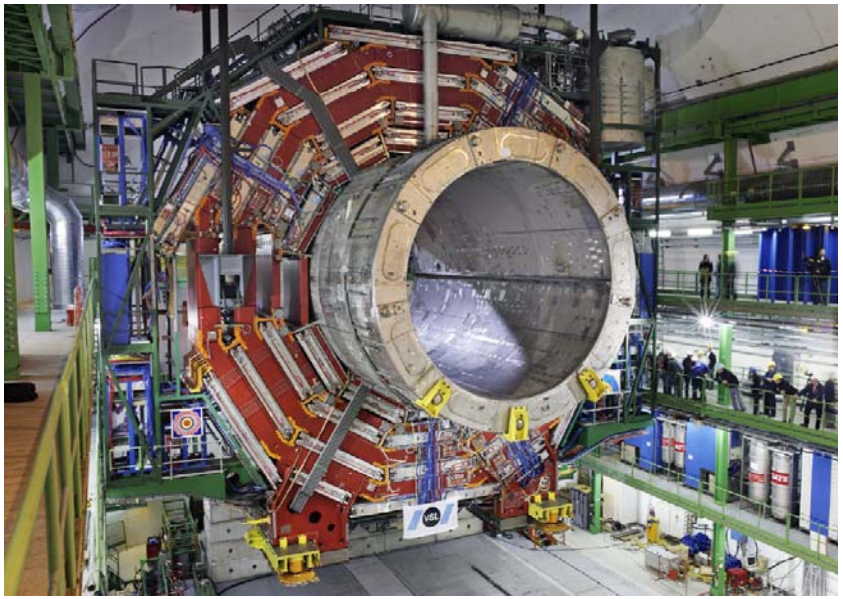






CMS Detectors

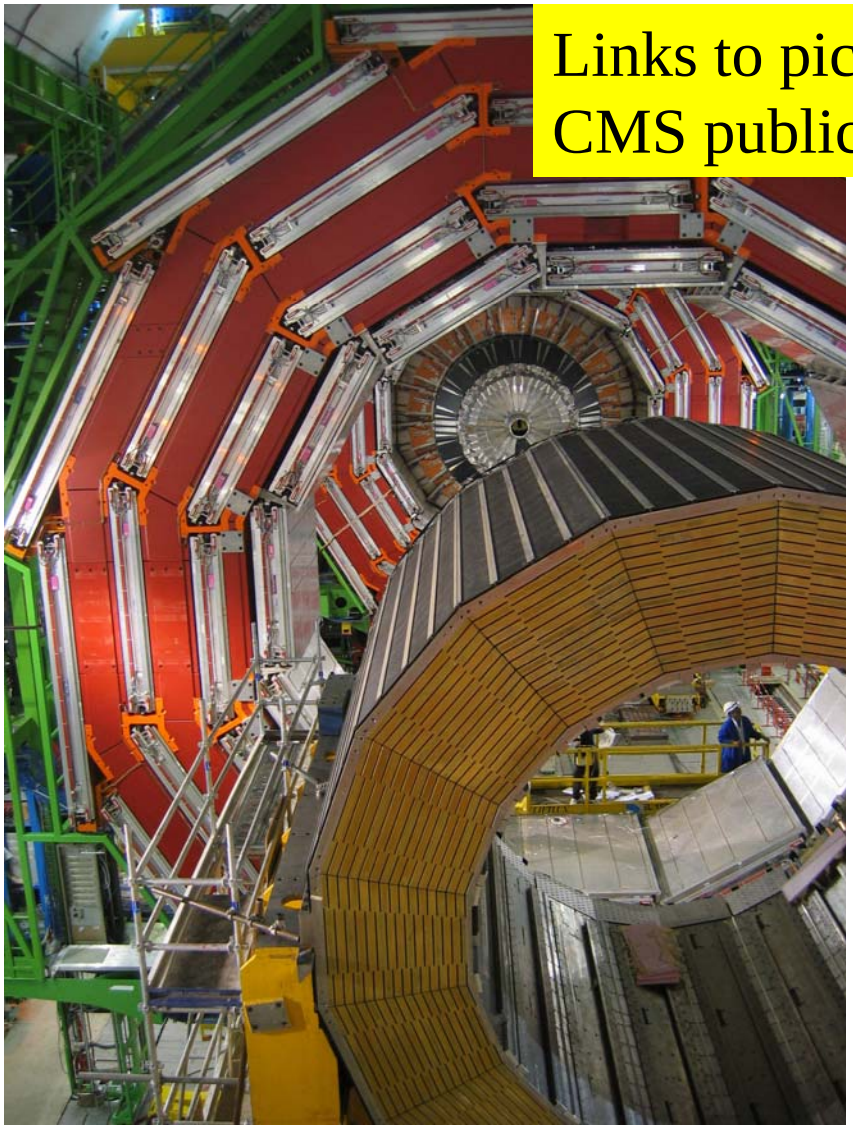




After cosmics and magnet test in Fall, 2006 in Assembly Hall we lowered into the Collision Hall. What remains is tracker cooling, pixel install and EE. Global runs with cosmics are ongoing.

CMS in UX

Links to pictures of lowering can be found on CMS public web page: http://cmsdoc.cern.ch



Countries by Detector

ECAL: UK, France, USA, …

HCAL: USA, Russia, Turkey…

Muon: Italy, USA, …

Track: Italy, USA, …

DAQ: Italy, USA, CERN

Webcams – SX and UX

http://cmsdoc.cern.ch/cms/outreach/html/cmseye/index.html

Go Bookmarks 39 blocked Check AutoLink AutoFill Settin

CMS construction at Point 5: current status

The current time at Point 5 is: Tuesday, 21h04

Snapshot from Camera 1
(click to enlarge)

This image shows HB- on the left, with the YB-1 on the right

Snapshot from Camera 2
(click to enlarge)

This image shows scaffolding built for the press for use during the lowering of YB0.

Snapshot from Camera 3

Snapshot from Camera 4

Spokespeople - CMS

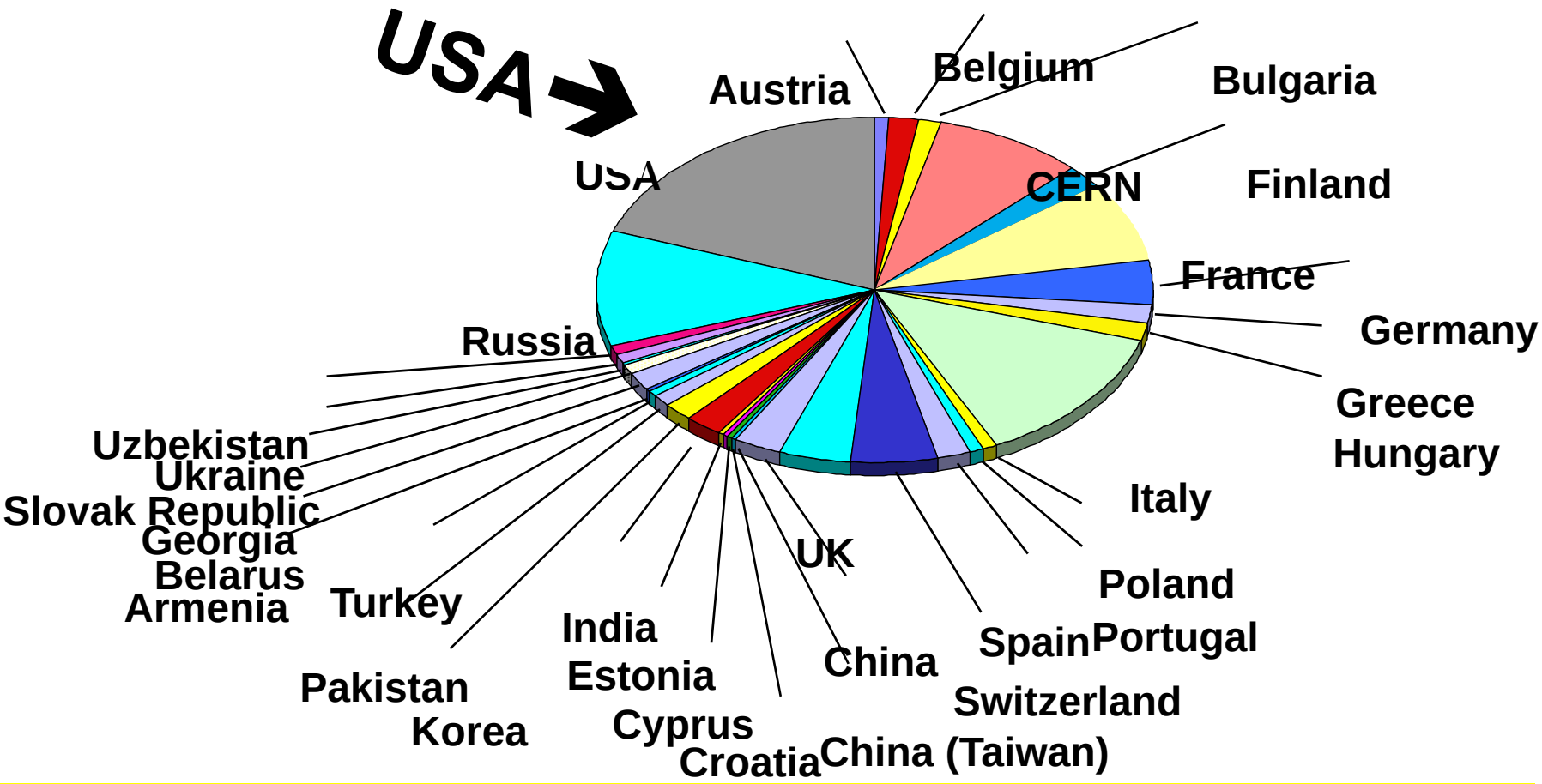
Jim Virdee

Guido Tonelli

Bob Cousins

Spokesman and his two deputy spokesmen

CMS: the Countries



Ordered by size: USA (525 collaborators), Italy (398), Russia (326), CERN (204), France (146), UK (117), Germany (116)

Acronyms

EB: Executive Board

MB: Management Board

DQM: Data Quality Monitoring

DCS: Detector Control System

DSS: Detector Safety System

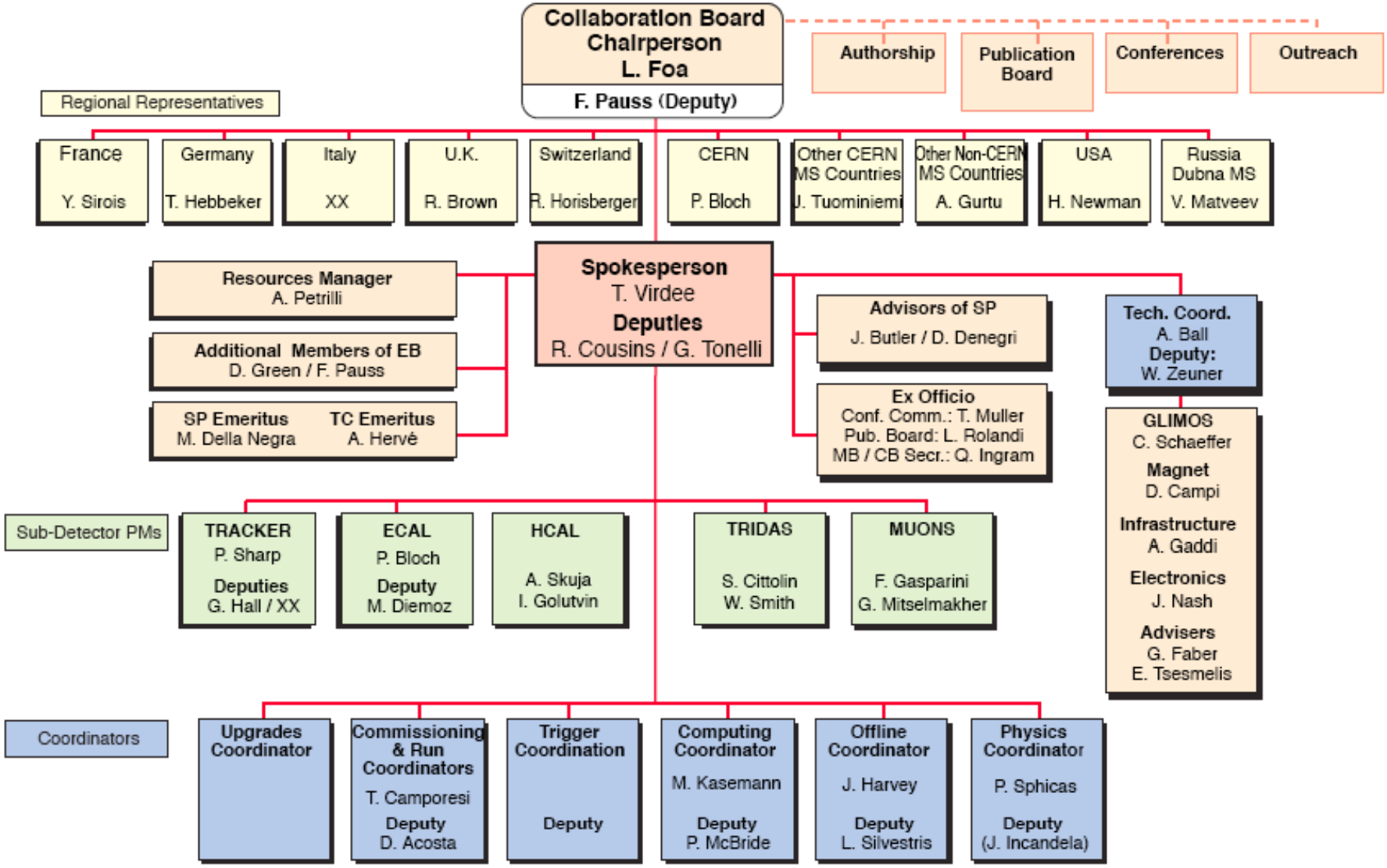
DPG: Detector Performance Group

POG: Physics Object Group

PAG: Physics Analysis Group

Etc., etc.

CMS General Organisation

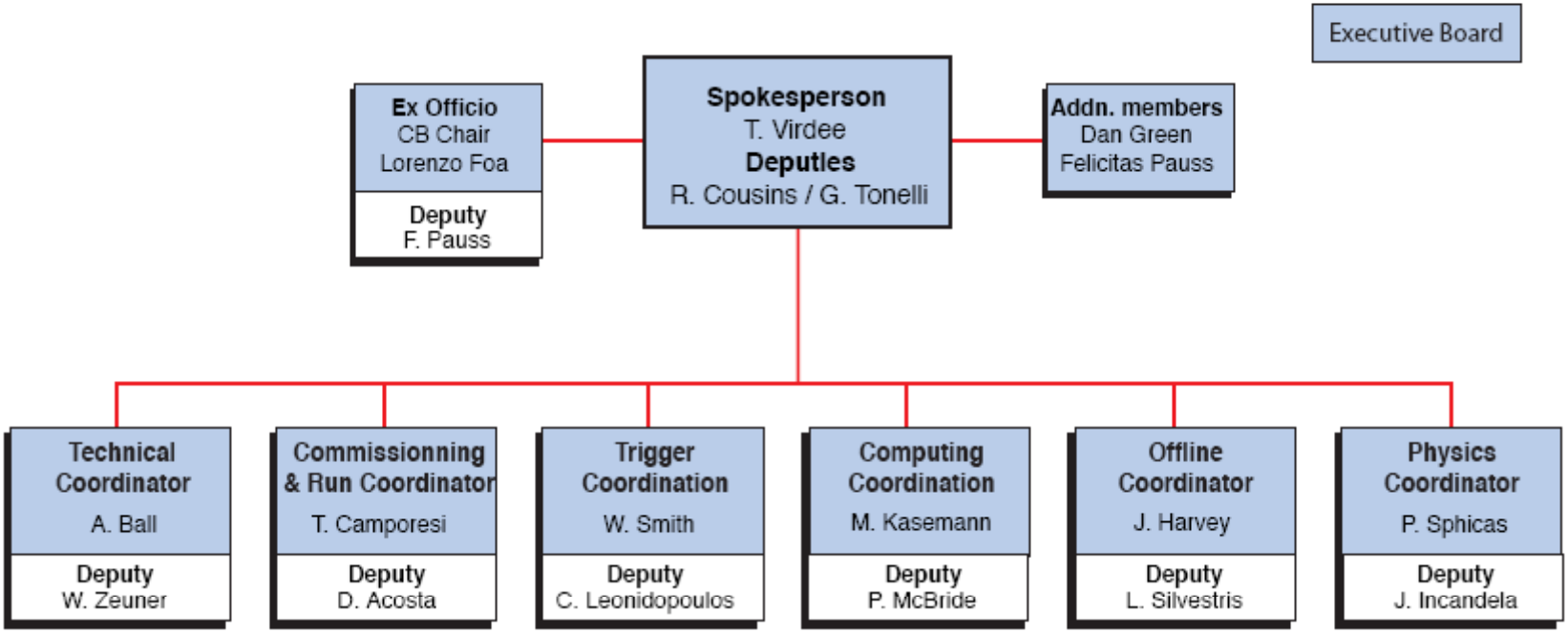


Meets Monthly

22 November 2008

Executive Board

CMS Executive Board

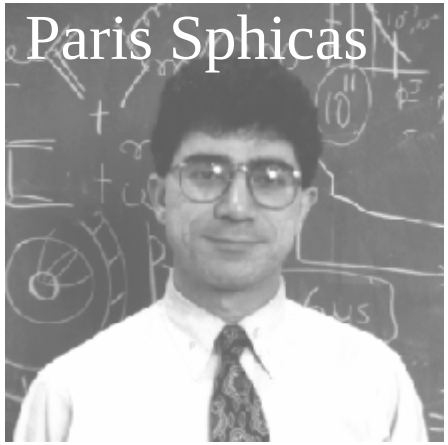


Meets in between MB meeting

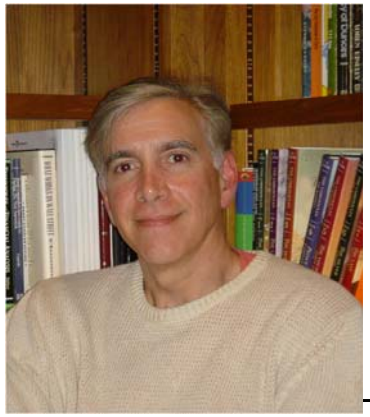
CMS Executive Board

Physics

Paris Sphicas



Joe Incandela



Software

John Harvey

Lucia Silvestris

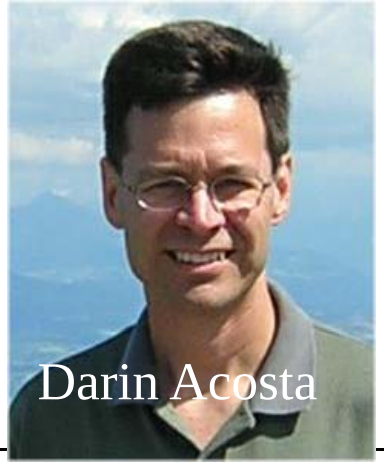
Computing

Matthias Kasemann

Patty McBride

Commissioning

Tiziano Camporesi



Darin Acosta

Computing, Offline, Detector Performance Groups (DPG)

Computing Coordination
M. Kasemman
P. McBride

Common Coordination & Integration Tasks

Offline Coordination
J. Harvey
L. Silvestris

Commissioning & Run Coordination
T. Camporesi
D. Acosta

Facilities/Infrastr/ Operations
D. Bonacorsi, NN

Computing Commissioning
S. Belforte
F. Wurthwein

Data Operations
C. Paus, NN

User Support
K. Lassila-Perini, NN

Software Development Tools
D.Lange, A.Pfeiffer

Framework
L Sexton-Kennedy, NN

Data & Workflow Management
P. Elmer, NN

HLT and DQM framework
E. Meschi, A. Meyer

L1 Software
J. Brooke
W. Sun

Calibration/Alignment
O. Buchmuller
L. Malgeri

Fast Simulation
F. Beaudette
P. Janot

Reconstruction
T. Boccali
S. Rahatlou

Simulation
F. Cossutti
D. Elvira

Analysis Tools
C. Jones
L. Lista

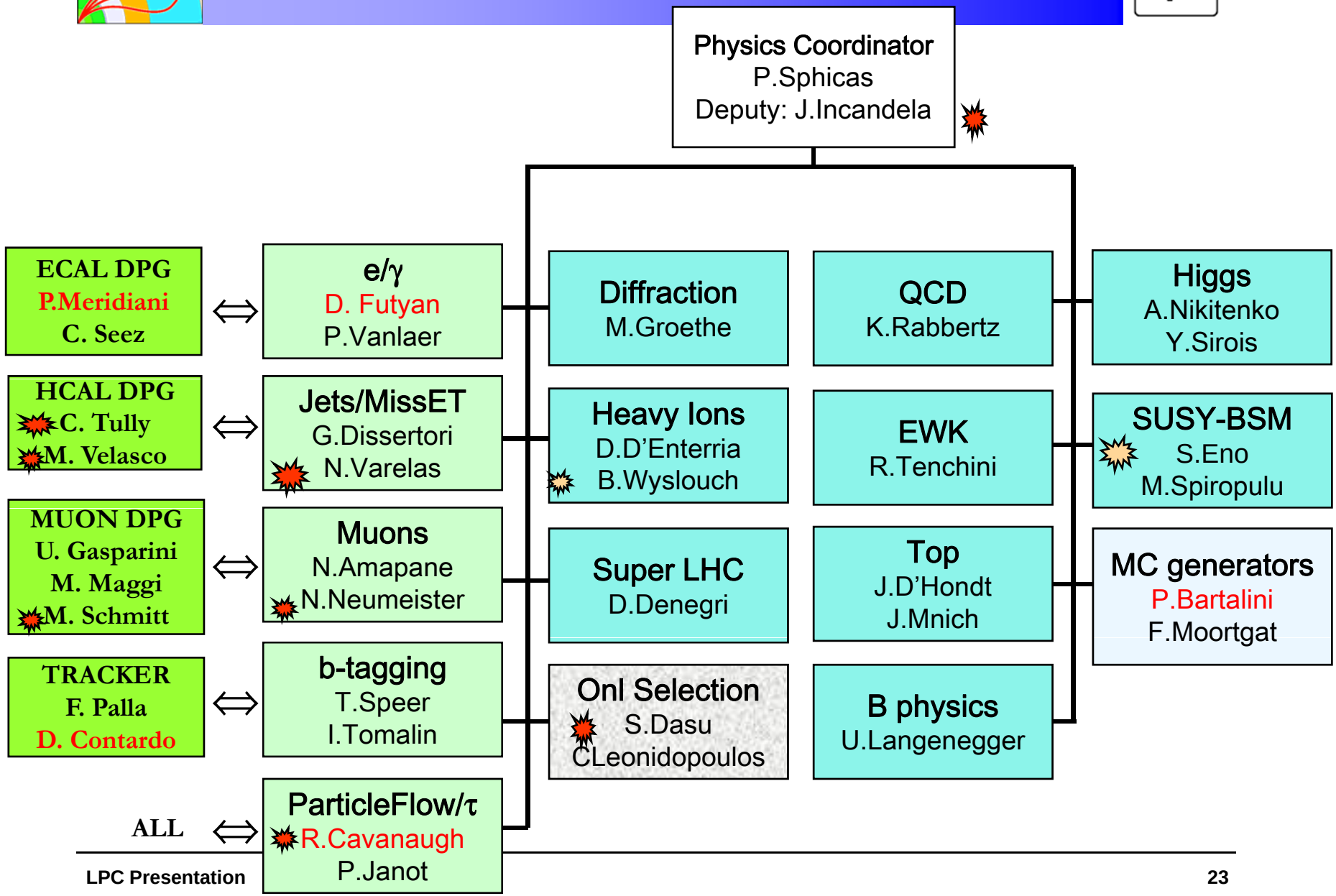
ECAL DPG
P.Meridiani
C. Seez

HCAL DPG
C. Tully
M. Velasco

MUON DPG
U. Gasparini
M. Maggi
M. Schmitt

TRACKER
F. Palla
D. Contardo

CMS Physics Organization



Weekly Physics Meetings

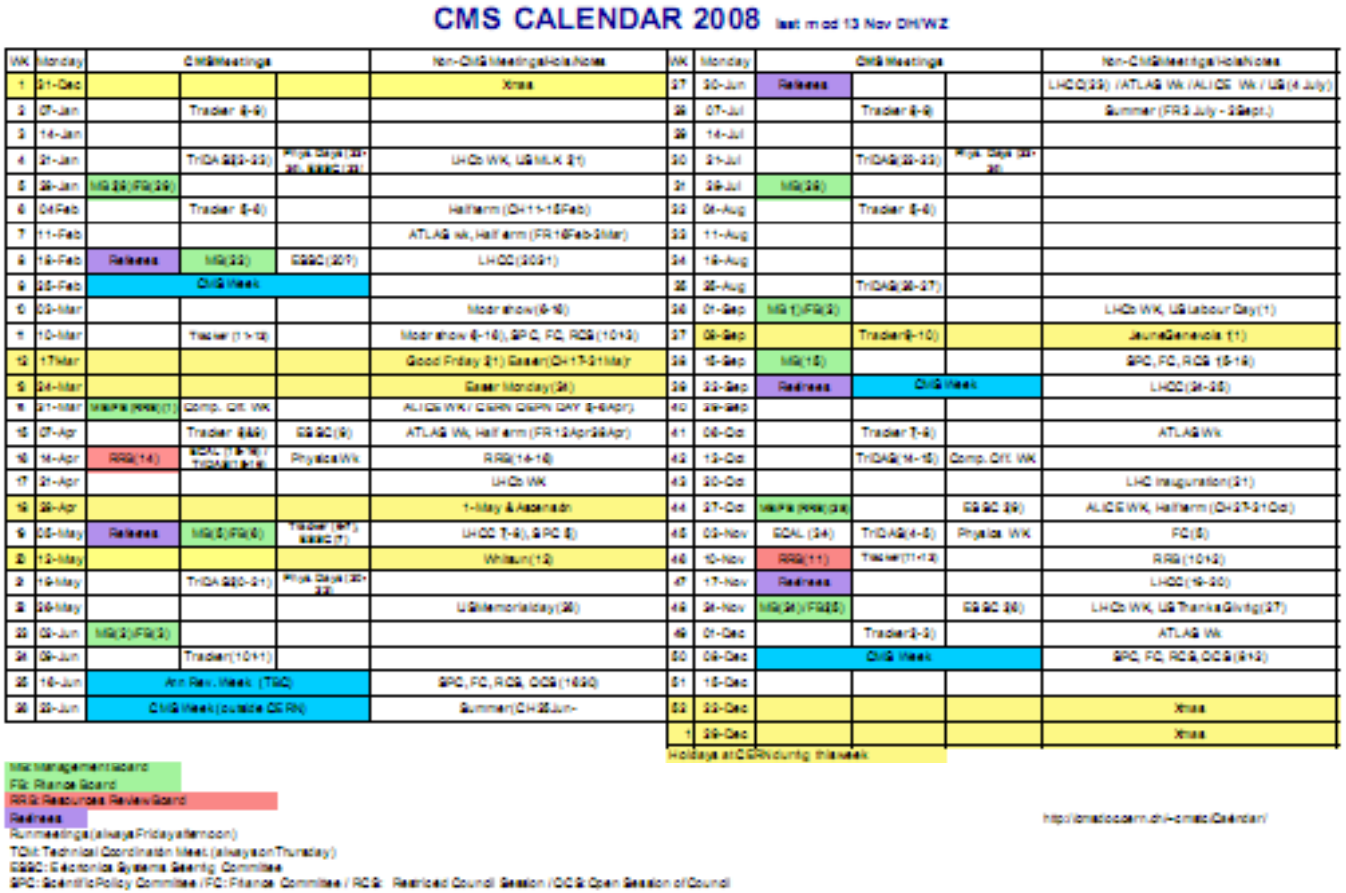
Start Time	Monday		Tuesday		Wednesday		Thursday		Friday	
8:30										
9:00				B Physics						
9:30										
10:00									Heavy Ions East (bi-weekly)	
10:30										
11:00										
11:30										
12:00										
12:30										
13:00										
13:30										
14:00										
14:30										
15:00	egamma & generators	muons & btag	QCD-EWK-Top (& B Physics if needed)		Online Selection & Phys Coord meeting		Particle flow -- tauID & JetMET		Diffraction	SUSY-BSM & Higgs
15:30										
16:00										
16:30										
17:00										
17:30										
18:00									Heavy Ions West (bi-weekly)	
18:30										
19:00										

Easy to attend via VRVS – note afternoon in CMS ~ morning at LPC

Physics in CMS Weeks

Start Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:30					
9:00			**Reports from DPGs, alignment & calibration, commissioning news**	**Analysis Groups presentations**	
9:30					
10:00					
10:30					
11:00					
11:30					
12:00					
12:30					
13:00					
13:30					
14:00			**POG and analysis meetings**	**Plenary Physics Meeting (group highlights, analysis approvals)**	
14:30					
15:00	**Common Offline-Computing meeting**	**Joint Offline-Physics meeting**			
15:30					
16:00					
16:30					
17:00					
17:30			**Physics Coordination Meeting**		
18:00					
18:30					

Typical CMS Calendar



CMS CALENDAR 2008 last mod 13 Nov DH/WZ

WK	Monday	CMS Meetings			Non-CMS Meetings/Holi/Notes	WK	Monday	CMS Meetings			Non-CMS Meetings/Holi/Notes
1	31-Dec				Xmas	27	30-Jun	Release			LHCC(23) / ATLAS Wk / ALICE Wk / US(4 July)
2	07-Jan		Tracker (6-9)			28	07-Jul		Tracker (6-9)		Summer (FR3 July - 29Sept.)
3	14-Jan					29	14-Jul				
4	21-Jan		TriDAS(22-23)	Phys. Days (22-24) / EGSC (23)	LHCb WK, US MLK (21)	30	21-Jul		TriDAS(22-23)	Phys. Days (22-24)	
5	28-Jan	MB(28)/FB(29)				31	28-Jul	MB(29)			
6	04-Feb		Tracker (6-8)		Halfterm (CH11-15Feb)	32	04-Aug		Tracker (6-8)		
7	11-Feb				ATLAS wk, Halfterm (FR15Feb-3Mar)	33	11-Aug				
8	18-Feb	Release	MB(22)	EGSC(20-21)	LHCC(20-21)	34	18-Aug				
9	25-Feb	CMS Week				35	25-Aug		TriDAS(26-27)		
10	03-Mar				Mod show (6-10)	36	01-Sep	MB(1)/FB(2)			LHCb WK, US Labour Day(1)
11	10-Mar		Tracker (11-13)		Mod show (6-14), SPC, FC, RCS (10-12)	37	08-Sep		Tracker(9-10)		Jaune Genevois (11)
12	17-Mar				Good Friday (21) Easter(CH17-21Mar)	38	15-Sep	MB(15)			SPC, FC, RCS (15-16)
13	24-Mar				Easter Monday(24)	39	22-Sep	Release	CMS Week		LHCC(24-25)
14	31-Mar	MB/FB (RRB)(1)	Comp. Off. WK		ALICE WK / CERN OPEN DAY (5-6Apr)	40	29-Sep				
15	07-Apr		Tracker (8-9)	EGSC(9)	ATLAS Wk, Halfterm (FR11Apr-28Apr)	41	06-Oct		Tracker (7-8)		ATLAS Wk
16	14-Apr	RRB(14)	ECAL (15-16) / TriDAS (16-18)	Physics Wk	RRB(14-16)	42	13-Oct		TriDAS(14-15)	Comp. Off. WK	
17	21-Apr				LHCb WK	43	20-Oct				LHC Inauguration(21)
18	28-Apr				1-May & Ascension	44	27-Oct	MB/FB (RRB)(28)		EGSC 29)	ALICE WK, Halfterm (CH27-31Oct)
19	05-May	Release	MB(5)/FB(6)	Tracker (6-7) / EGSC (7)	LHCC (7-8), SPC (8)	45	03-Nov	ECAL (3-4)	TriDAS(4-5)	Physics WK	FC(5)
20	12-May				Whitsun(12)	46	10-Nov	RRB(11)	Tracker(11-13)		RRB(10-12)
21	19-May		TriDAS(20-21)	Phys. Days (20-22)		47	17-Nov	Release			LHCC(18-20)
22	26-May				US Memorial day(26)	48	24-Nov	MB(24)/FB(25)		EGSC 26)	LHCb WK, US Thanks Giving(27)
23	02-Jun	MB(2)/FB(3)				49	01-Dec		Tracker(2-3)		ATLAS Wk
24	09-Jun		Tracker(10-11)			50	08-Dec	CMS Week			SPC, FC, RCS, OCS (9-12)
25	16-Jun	Ann Rev. Week (TBC)			SPC, FC, RCS, OCS(16-20)	51	15-Dec				
26	23-Jun	CMS Week (outside CERN)			Summer(CH23Jun-	52	22-Dec				Xmas
						1	29-Dec				Xmas

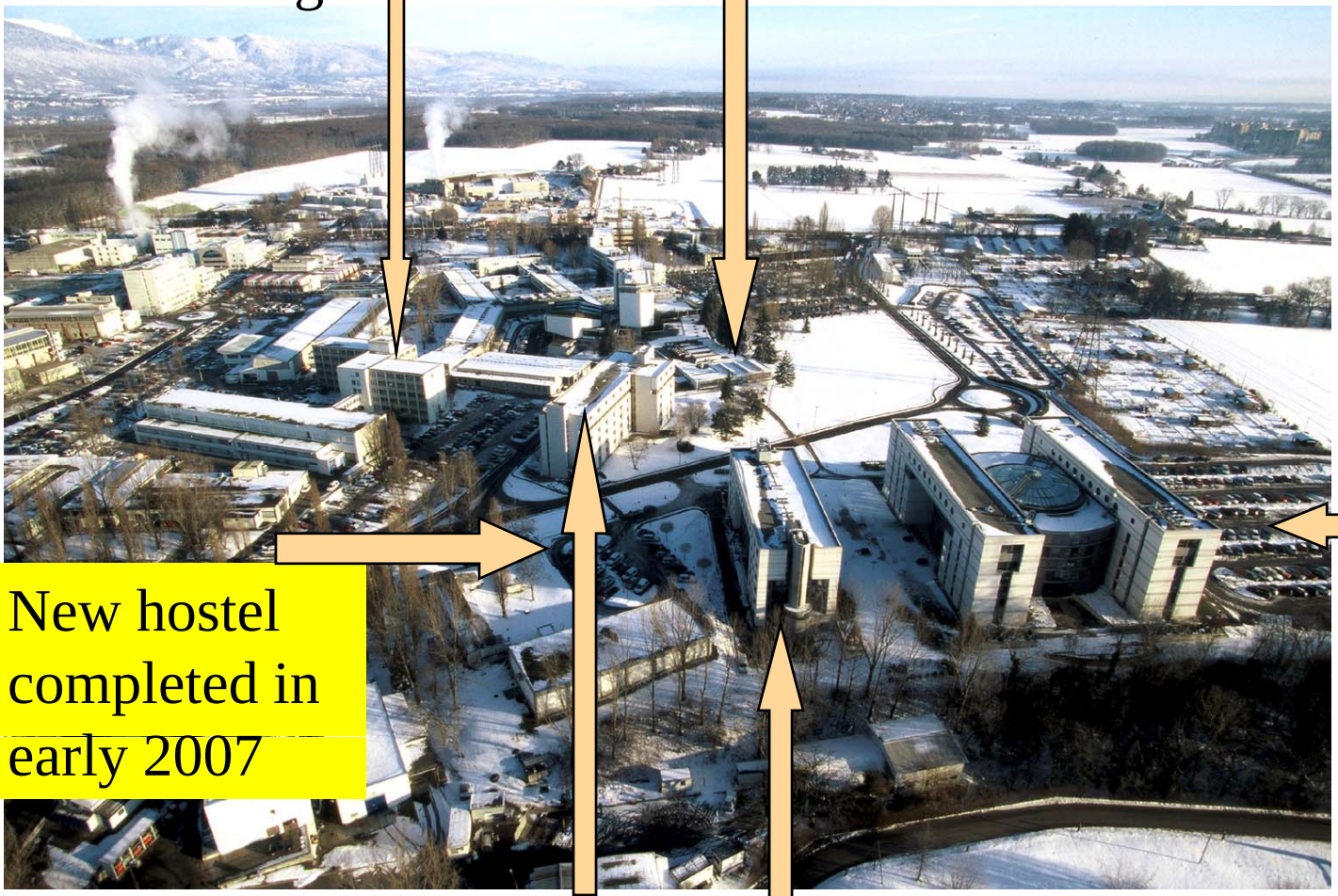
Holidays at CERN during this week

MB: Management Board
FB: Finance Board
RRB: Resources Review Board
Releases
Runmeetings (always Friday afternoon)
TCM: Technical Coordination Meet (always on Thursday)
EGSC: Electronics Systems Steering Committee
SPC: Scientific Policy Committee / FC: Finance Committee / RCS: Restricted Council Session / OCS: Open Session of Council

http://matrix.cern.ch/~cmsc/Calendar/

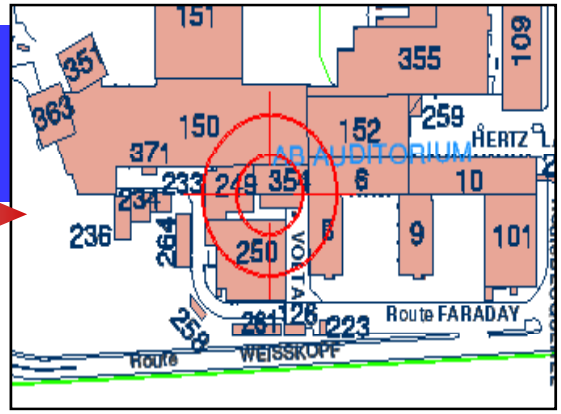
CMS and Physics weeks are of general interest. Each detector system also has “weeks”.

The Lab: Useful things



The Bermuda triangle of CERN

Status of CMS Centre



Space allocation: good progress

- **iberate 1st floors of buildings 6, 8, 9**

Meeting rooms:

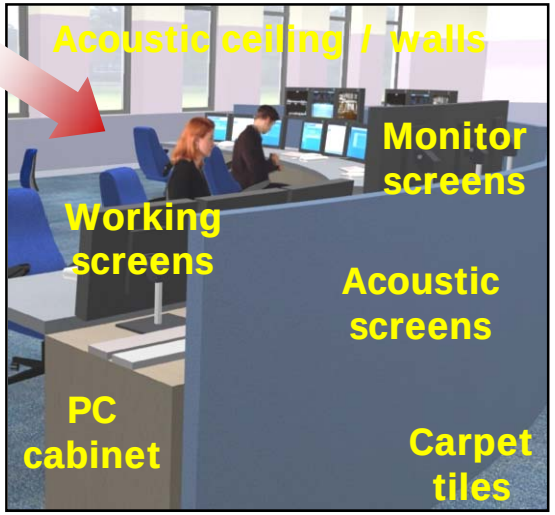
- **PS auditorium and 3-4 other meeting rooms around**

PS main control room available for CMS: May '07

- **Power, air-con, acoustics, etc. TS plan to finish July 07**

Timescale for basic CMS Centre ready: Nov 2007

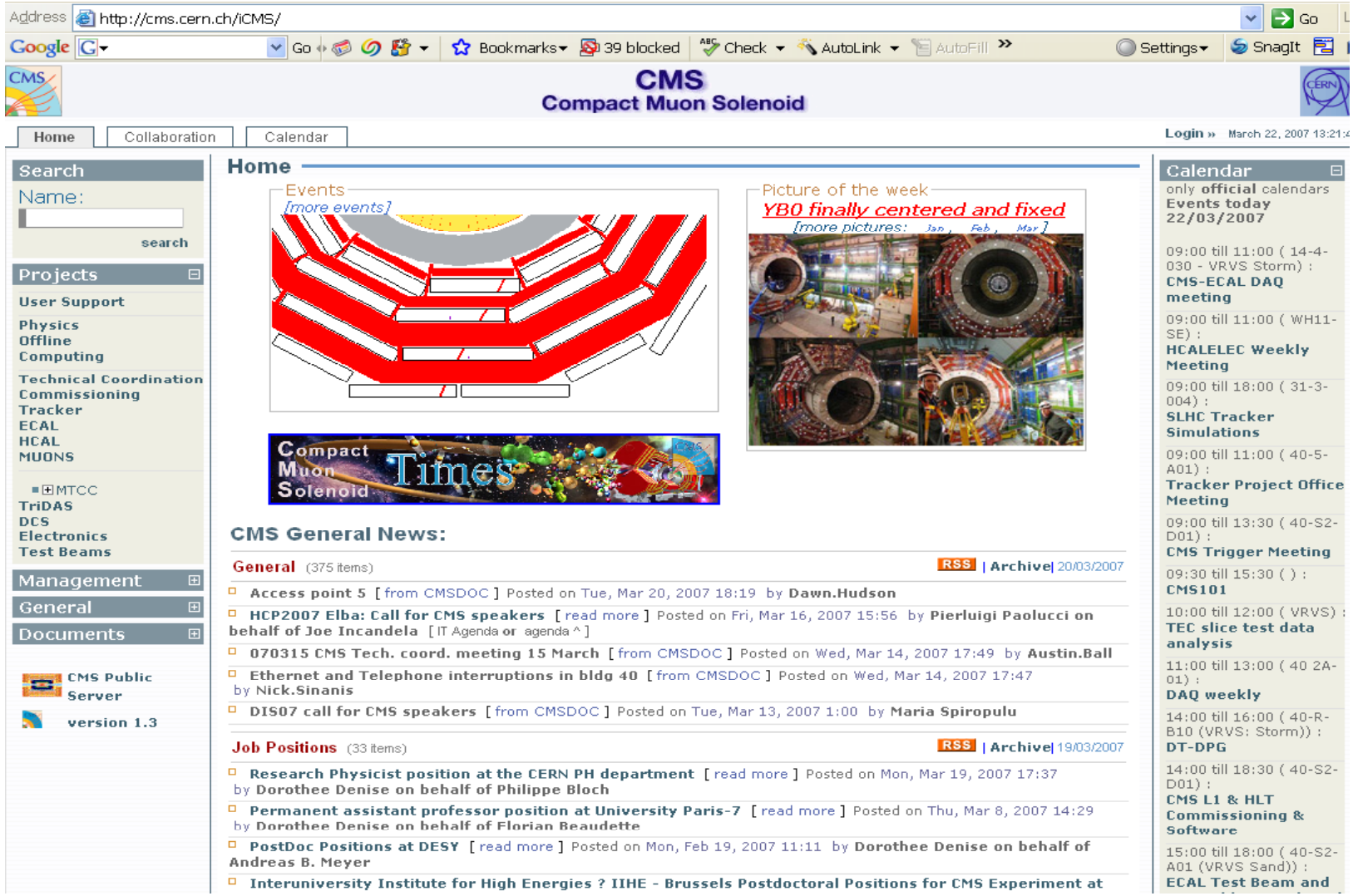
- **Full CMS Centre: Mar 2008, physics run**



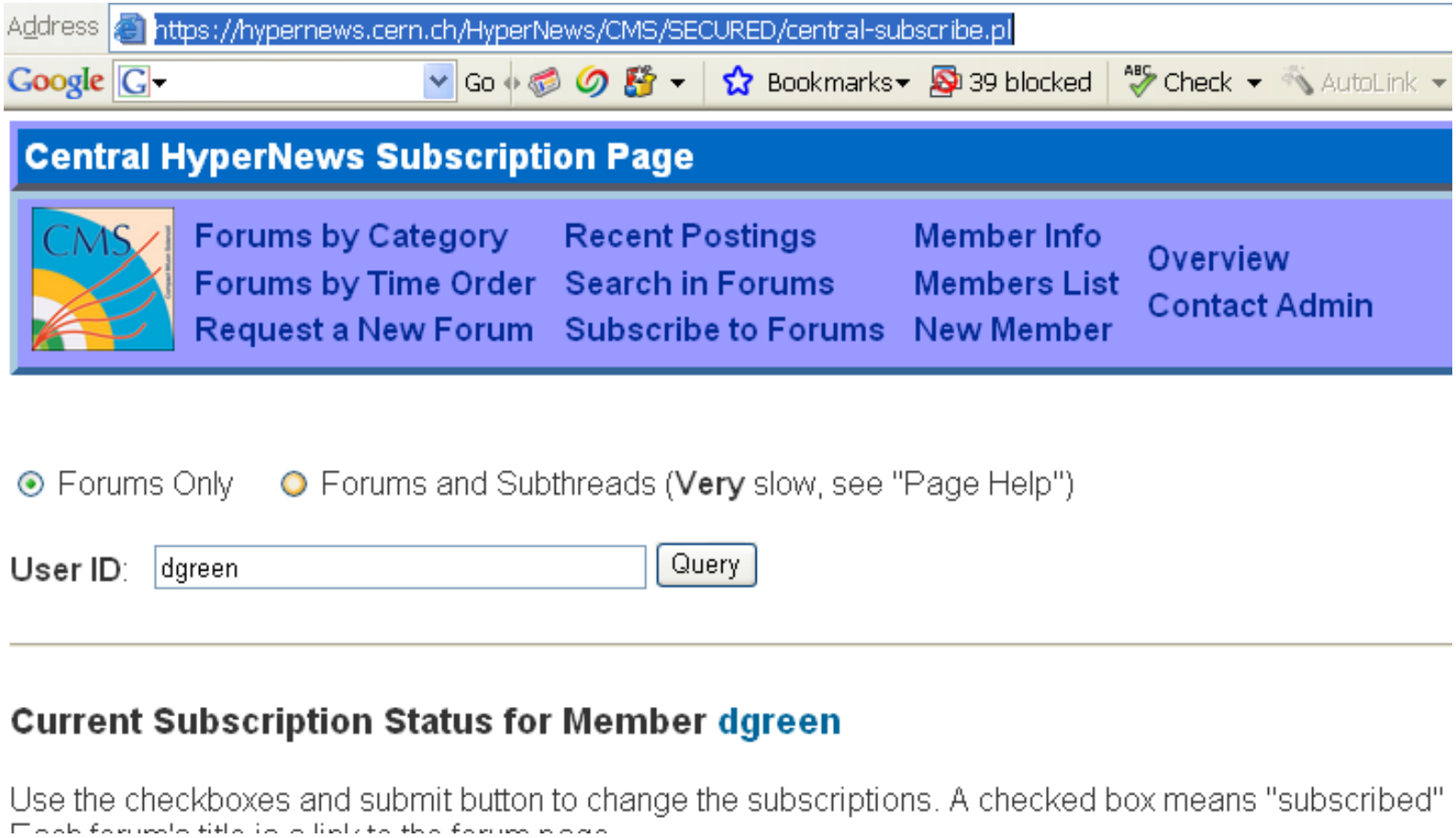
Physics Papers

- Description of CMS detector and performance published at: http://cmsdoc.cern.ch/cms/Publications/detpaper/CMS-JINST.pdf
- physics TDR volume I - also II (http://cmsdoc.cern.ch/cms/cpt/tdr/index.html)
- Dan Green's run plan (http://xxx.lanl.gov/abs/hep-ph?papernum=0601038)

ICMS Page – Start Here

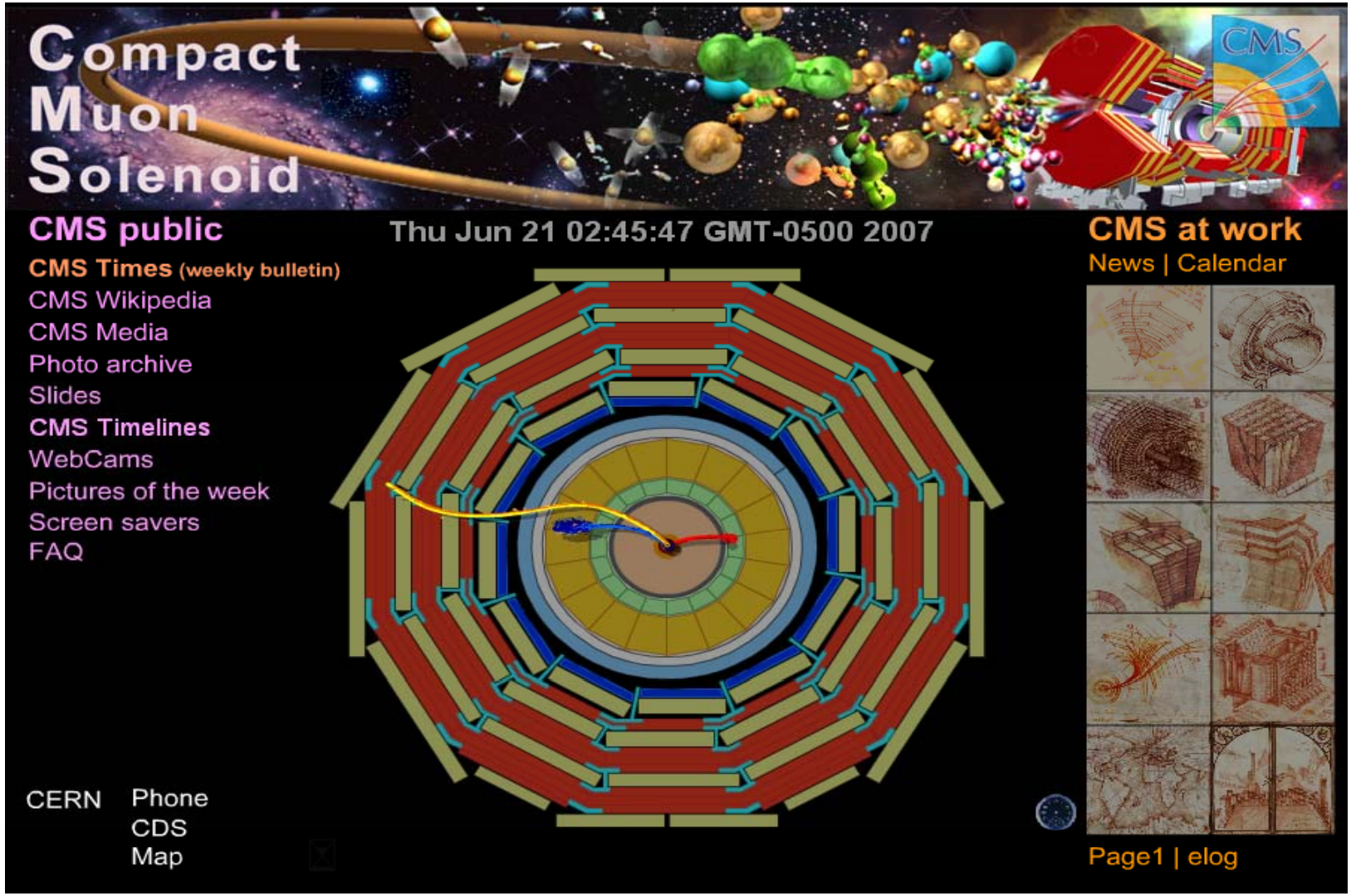


CMS Hypernews Fora



(Old web site: http://cmsdoc.cern.ch/cms.html)

More Info – CMS. http://cms.cern.ch



CMS Wiki

Address https://twiki.cern.ch/twiki/bin/view/CMS/WebHome

Google Go Bookmarks 39 blocked Check

CMS

* *CMS Homepage*
CMS Twiki
Changes
Index
Search

Subproject Topics
Tracker
Preshower
ECAL
HCAL
Muon
TriDAS
Lumi Project
PRS, Software, Computing
Technical Coordination
User Support
User Support Home
CMS Offline Workbook
SWGuide Offline Manual
Reference Manual
MTCC Workbook
Workbook Glossary
FAQ
Miscellaneous
CMS Conventions
CMS country pages
TODO iCMS Migration
CMS PROOF
Physics Homepage
Physics Object Groups
Egamma POG
Jets/Missing Et
Particle Flow/tau
Muon POG
Vertexing
B-tagging
Online Selection

You are here: TWiki > CMS Web > WebHome

CMS Wiki Home Page

The CMS Wiki enables you to simply create Web pages and edit them th

CMS Sub-project Wiki Pages

- Tracker
- Preshower
- ECAL
- HCAL
- Muon
- TriDAS
- Lumi Project NEW
- CPT (PRS, Software and Computing)
- Technical Coordination

Physics Groups

Physics home page

Physics Object Groups

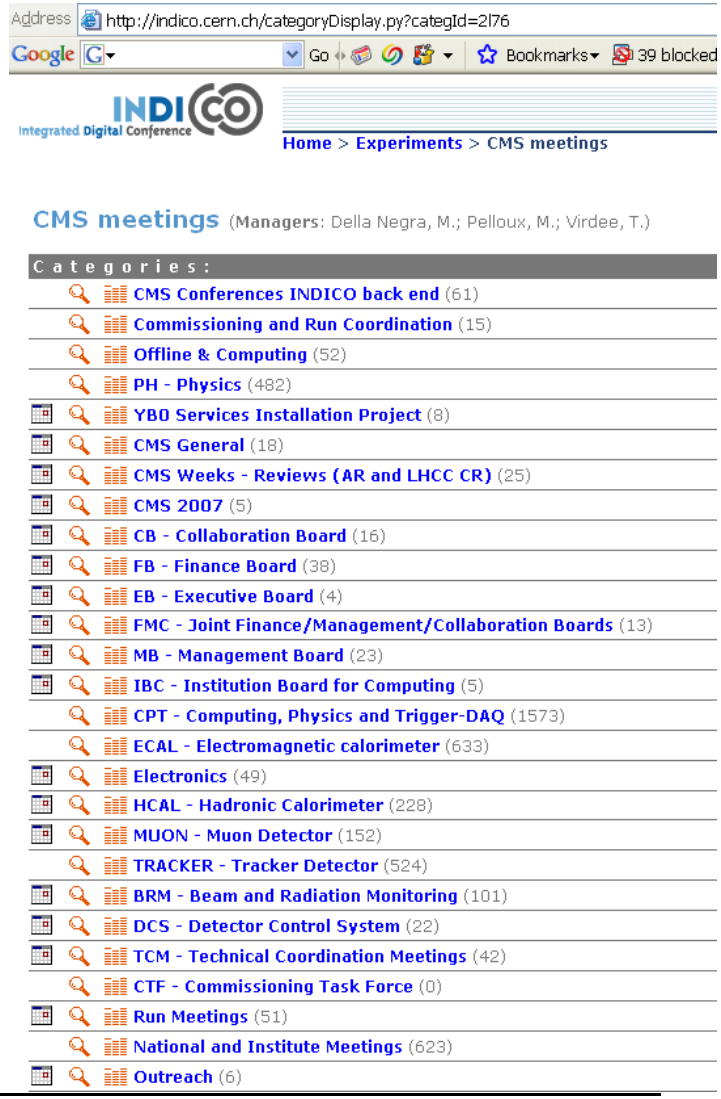
- Egamma POG
- Jets/Missing Et
- Particle Flow / tau
- Muon POG
- Vertexing
- B-tagging
- Online selection

Physics Analysis Groups

CMS Agenda Server

http://agenda.cern.ch/displayLevel.php?fid=2l76

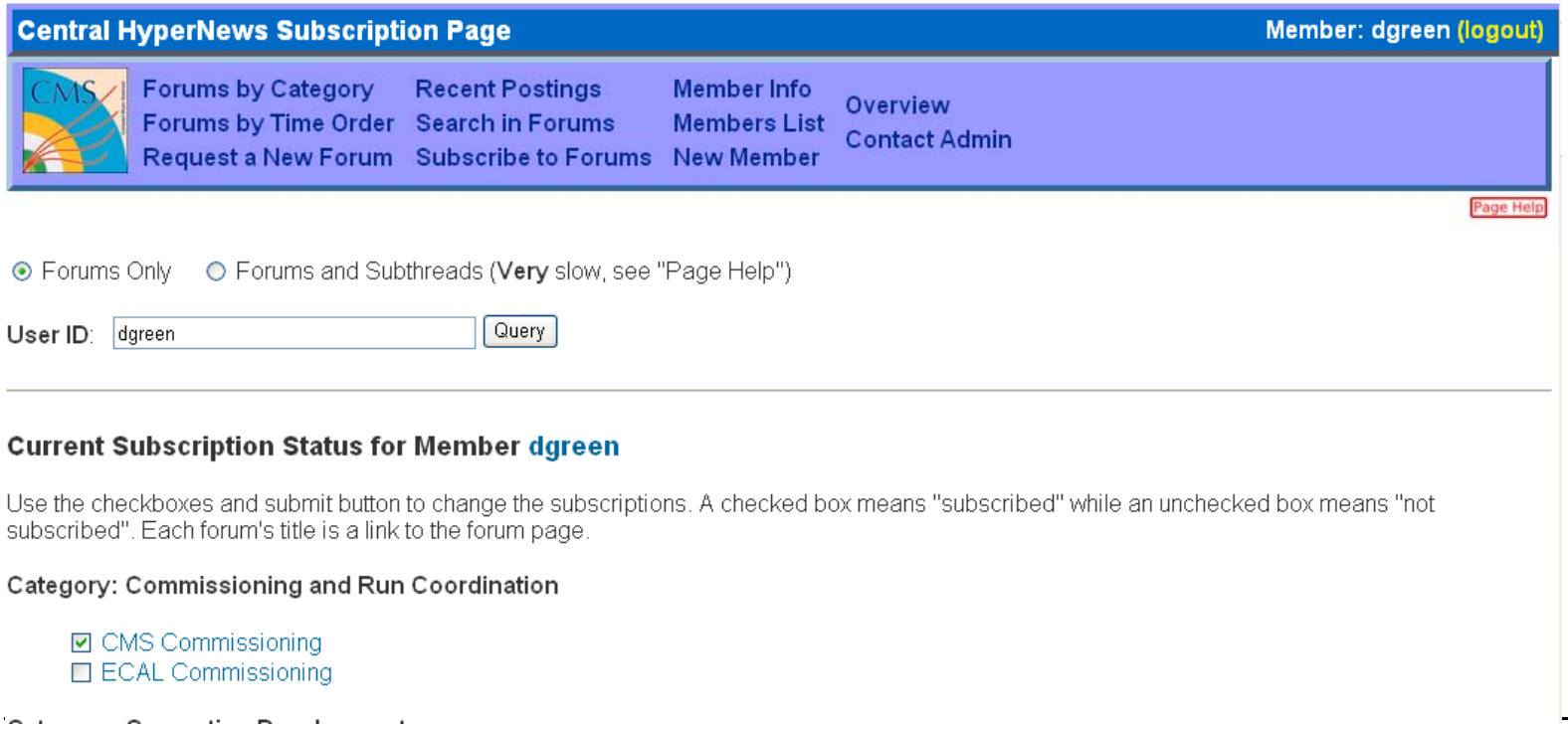
Quite useful. Find talks from most meetings. Serves as CMS institutional memory.



Getting onto CMS mailing lists

First, you need a CERN mail account and password.
Then go to http://wwwlistbox.cern.ch/
And log onto SIMBA using this account/pass

Warning: there are also USCMS mailing lists that are not in this system! These in listserv



EVO - Teleconferencing

CMS now uses EVO for video conferencing. Surveys in train for new rooms, hardware and software tools (see L. Taylor).

- go to radio shack and buy a headset and buy a video camera. Don't use a table mike, etc unless you get expensive hardware. Instead, use a cheap headset.
- go to www.evo.caltech.edu and download the free software (enable pop ups and java)
- MUTE WHEN YOU ARE NOT TALKING!!!

Workbook and Tutorials - CMSSW

Address https://twiki.cern.ch/twiki/bin/view/CMS/WorkBook

Google Go Bookmarks 39 blocked Check AutoLink AutoFill Settings SnagIt

Jump Search

Edit WYSIWYG Attach Printable

You are here: TWiki > CMS Web > WorkBook

r139 - 16 Mar 2007 - 13:54:14 - CMSUserSupport

CMS

- * *CMS Homepage*
- *CMS Twiki*
- *Changes*
- *Index*
- *Search*

Offline Workbook
Glossary
Index
Summary of Changes
Site Map
Print as PDF
For Contributors
User Support
Offline SW Guide
Reference Manual
Online/MTCC WkBk
BEGINNING LEVEL
Preface
Acknowledgements
Using the Workbook
1. Getting Started
Introduction
Get an Account
Setup Computing Env
Computing Concepts
Resources/Information
First visit to CERN
2. Basics of Offline
Introduction
Goals & Detector
Computing Model
Application Framework
Config File Language
3. Learning Offline Tools
Introduction
Data Formats & Tiers
Ways to Analyze
Framework Tutorial
Finding Data

The CMS Offline WorkBook

Complete:

In two sections: Beginning and Advanced

Tutorial Overview: Click here!

BEGINNING LEVEL WORKBOOK

Preface

- Acknowledgements
- Using the Workbook
- Information for Contributors

Chapter 1: Getting Started

- Introduction
- Getting a Computing Account
- Setting up your Computing Environment
- CMS Computing Concepts: Programming, CVS, etc
- Useful Resources and Vital Information
- On your First Visit to CERN

Chapter 2: The Basics of CMS Offline Computing

- Introduction
- Overview of CMS Physics Goals and Detector
- The CMS Computing Model
- The CMSSW Application Framework
- Description of Configuration File Language

Purpose

The CMS offline workbook provides background information and initial instruction on accessing computing resources and using the software to perform analysis within the CMS collaboration. Organized into Beginning and Advanced sections, it is designed as the first-stop for both users and software developers. This workbook, the Reference Manual and the CMS Offline Guide, together, are intended to form a comprehensive set of documentation for CMS data analysis.

Newsbox:
15 Mar 07: The CMSSW version will be updated to 1_2_0 very soon, some tutorials may not work proprely for a short while, but they will be fixed.
The whole workbook was reviewed prior to the print in December 06. Copies of the hardcopy Dec06 workbook were available at Helpdesk (40-3-A15) but there are none left.
Tutorials have been updated for 1_0_6 early October 06, and some of them for 1_2_0 in December 06.
The current CMSSW release as reflected throughout this

Arriving at CERN

- Swiss and French electricity adaptors have slightly different sizes. Both have 2 round prongs.
- rental cars usually have manual transmissions

If you are staying at the hostel and arrive on the weekend, the guards will have the key. Ask the driver to go to the CERN gate with the flags - Entrance B.

Very hard to get “hostel” room in summer. Registration begins April 1. Sometimes (especially for FNAL employees) Tami Kramer and Terry Read can get you rooms, as they get priority to reserve, and reserve a block.

CERN Users Office

ID needed to get into CERN after hours. Also access to CMS –P5 and to log safety training for access to the UX Hall. Must have safety “1,2,3” to get an ID. Must have safety “4-CMS” to get into UX

It has to be renewed every five years.

CMS Secretariat

http://cmsdoc.cern.ch/peoplesecr.shtml

Paper supplies, pens, cute folding cubes of CMS pictures, cute calendars with CMS pictures, etc.

US CMS Project Office @ CERN

Can help with various things. Rentals, room reservations when building 40 is full, hostel reservations, all kinds of useful things…

Tami.Kramer@cern.ch
tina.vernon@cern.ch
Salavat.Abdoullin@cern.ch

http://uscms.web.cern.ch/uscms/

Many useful hints on life at CERN link off US CMS home page

US CMS - > 350 PhD Physicists

By size (physicists)

FNAL: 58

Florida: 21

UCLA: 15

Davis: 13

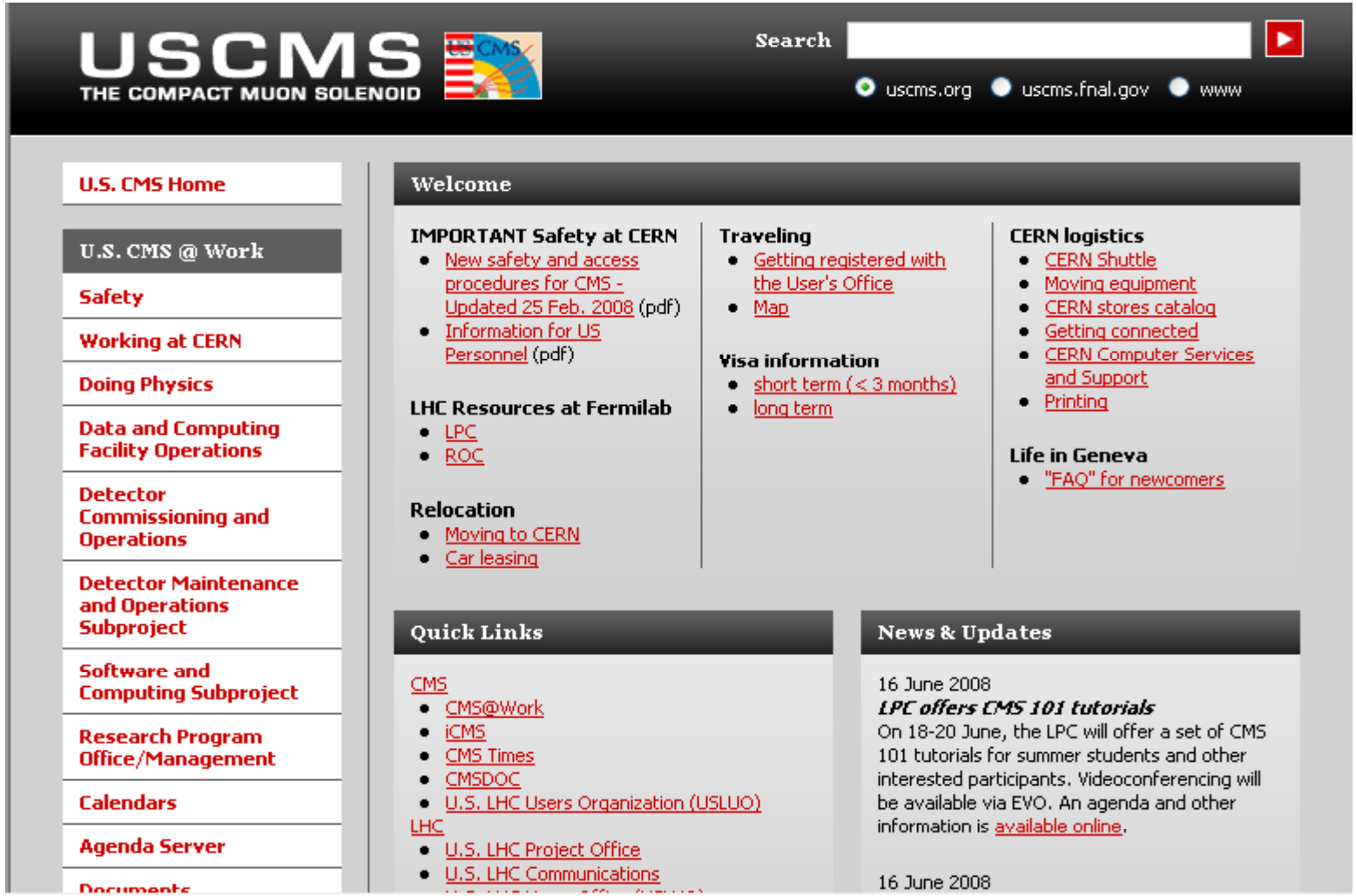
MIT: 13

Rochester: 13

Rutgers: 11

US CMS Web page

http://www.uscms.org/uscms_at_work/index.shtml/



US CMS: Research Program

Research Program Manager: Joel Butler, Deputy: Dan Marlowe

Level 2 managers:

pixels: Bruno Gobbi (Northwestern). **tracking**: Joe Incandela (UCSB) **Endcap Muons**: Dick Loveless (Wisconsin), Paul Padley (Rice) **DAQ**: Vivian O'Dell (FNAL) **ECAL**: Roger Rusack (Minnesota) **HCAL**: Julie Whitmore (FNAL) **Trigger**: Wesley Smith (Wisconsin)

Software Management: Lothar Bauerdick

[level 2 Bob Clare (UC) and Ian Fisk (FNAL)]

CMS Maintenance and Operations: Jim Freeman (FNAL)

US CMS: Elected

http://uscms.fnal.gov/uscms/organization/organization.html

Very elaborate elected structure

•US CMS Collaboration Board: chair: Harvey Newman (cal tech), deputy chair: Vasken Hagopian (FSU) members: 1 rep per institution.

•US CMS Advisory Board: chair and deputy the same, + 1 elected rep per system + US physics coordinator + outreach coordinator + software/computing manager + construction project manager

•US CMS Advisory software and computing Board (6 elected positions)

• US CMS election committee (2 elected positions)

• US physics coordinator (1 elected position) Greg Landsberg (Brown)

• various subsystem institutional boards (1 rep per institution)

US CMS Meetings, e-mail

1 per year in late spring, place rotates. Good place to network.

Weekly meeting of “all US CMS” at 2:30 pm on Friday

Make sure you are on the us cms mailing list by sending a mail to listserv@fnal.gov. Leave the subject line blank. In the body, put “subscribe uscms-all eno@physics.umd.edu Sarah Eno” except don’t put the quotes and substitute your information. (there are many email lists for uscms on this listserv. Go to http://computing.fnal.gov/email/listserv/ to find out how to find out all the names. Look for names starting USCMS-XXX)

US CMS FNAL Phys
E-mail: USCMS-FNALPHY@listserv.uscm...

US CMS, PAC
E-mail: uscms-pac@listserv.fnal.gov

US_CMS, AB
E-mail: uscms-ab@listserv.uscms.org

US_CMS, ALL
E-mail: uscms-all@listserv.uscms.org

US_CMS, ASCB
E-mail: uscms-ascb@listserv.uscms.org

US_CMS, CB
E-mail: uscms-cb@listserv.uscms.org

US_CMS, L2
E-mail: uscms-l2m@listserv.uscms.org

US_CMS, PO
Business Fax: 2194
E-mail: uscms-po@listserv.uscms.org

USLHC_SWC
E-mail: USLHC-SC@USCMS.org

US CMS Meetings

US CMS (**Managers**: Gartung, P.; Kramer, T.; Bauerdick, L.; Butler, J.; I

Categories:

- 2008 Election (1)
- ASCB Retreat Pasadena (2)
- FNAL Computing User's meeting (9)
- FPix (4)
- PIRE (5)
- Project Management (2)
- US420m (3)
- USCMS Operation (73)
- USCMS Research Program (18)
- USCMS Upgrades (5)
- Physics/Users meeting (4)
- PhysicsAnalysis (14)
- The LHC Physics Center (LPC) (774)
- SiTracker (177)
- USCMS Collaboration Meetings (6)
- USCMS Tier-2 (74)
- VirtualControlRoom (3)

All US CMS Meeting

- (almost) every Friday 11 am FNAL time, 6 pm CERN time
- well-attended both in person and via EVO
- "refreshments @ CERN" –weekend

Typical Agenda

- Research Program news– Joel
- CMS Center at FNAL – Lothar
- Report on status @ CERN
- one topical talk

US CMS Weekly Meeting - 13 June 2008

Friday 13 June 2008
from 11:00 to 12:50US/Central
at CERN (40-5-A01)

Description: Times are FNAL times. Meeting will be in the FNAL high rise, 11NE. EVO will be available. You don't need to know the room, just go to the EVO page, log in, pick "enter", and look for "all us cms meeting" in the CMS community. Note that the phone bridge info can be found by clicking on the blue circle with the i in the middle. If there are EVO problems please send a message on the chat or phone the WH11NE room where a default to speakerphone can be made. The number is: (630) 840-8073. Submissions - use pw = lpcphysics
Location at CERN is bldg 40-5-A01, starting at 6:00 pm Geneva time, with refreshments @ CERN served at 5:30 pm.

Friday 13 June 2008 |

Friday 13 June 2008 top

11:00	RP News (10')	Joel Butler (*Fermi National Accelerator Laboratory (FNAL)*)
11:10	CMS Center News (10') (Slides)	Jon Alan Bakken (*Joseph Henry Laboratories*) , Lothar Bauerdick (*FERMILAB*)
11:20	CMS and LHC Installation and Commissioning Status (10') (Slides)	Jeffrey Spalding (*Fermilab*) , Slawek TKACZYK (*Fermilab*)
11:30	ECAL Performance in CRUZET (30') (Slides)	Jason Haupt (*U. of Minnesota*)

Tiered System for Data Flow

T0 at CERN

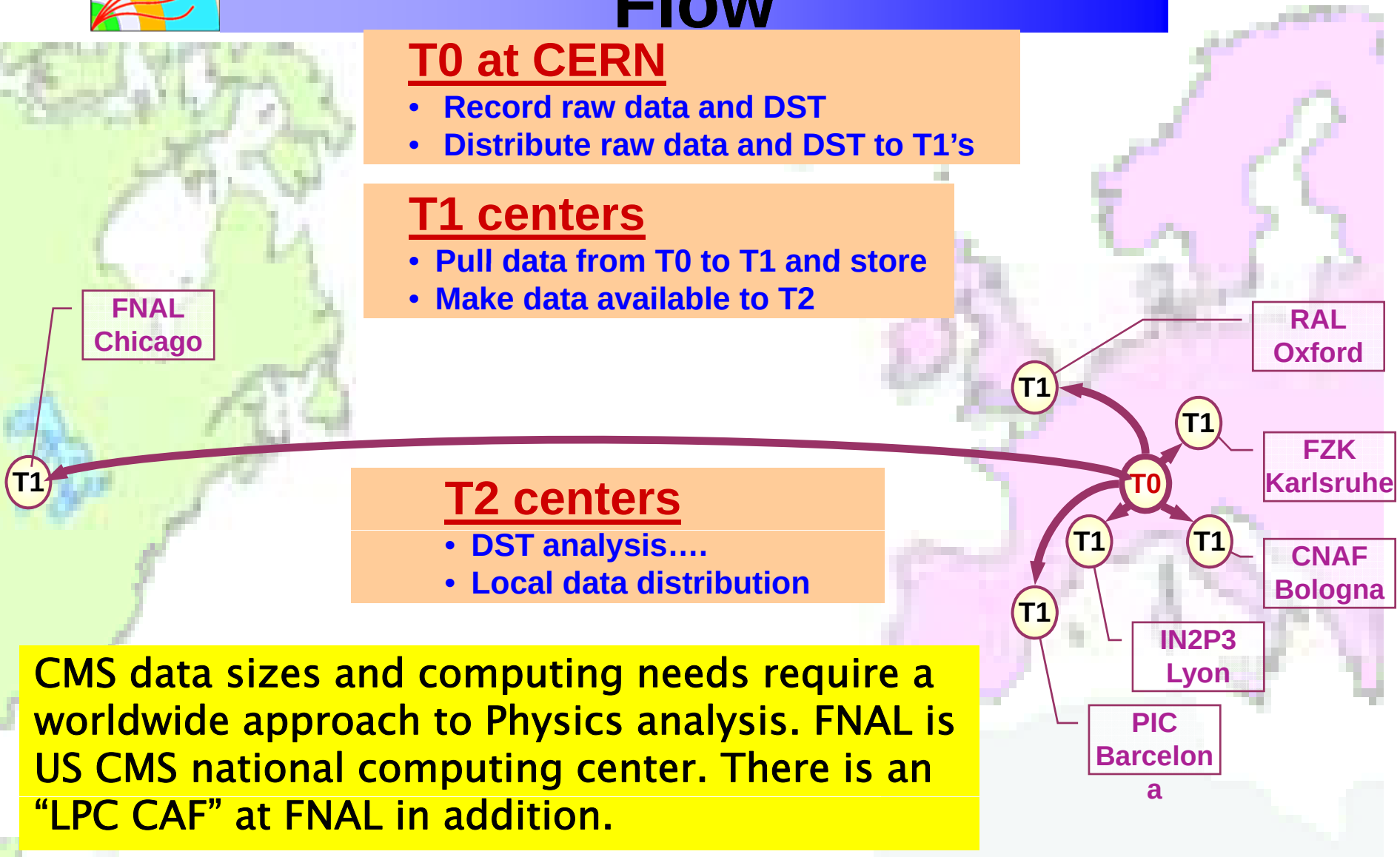
- Record raw data and DST
- Distribute raw data and DST to T1's

T1 centers

- Pull data from T0 to T1 and store
- Make data available to T2

T2 centers

- DST analysis….
- Local data distribution

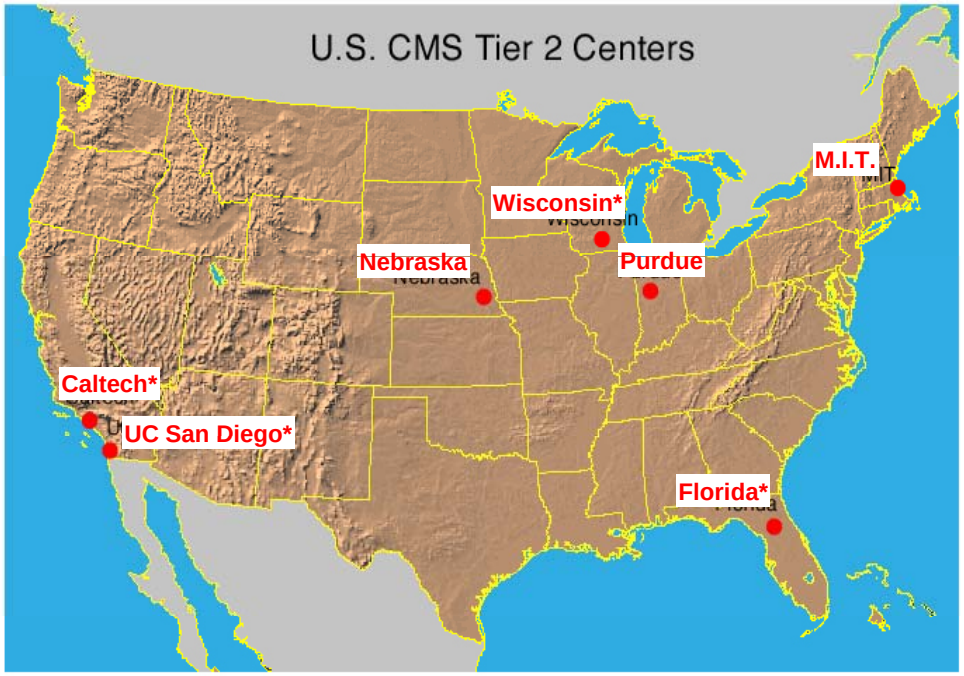


CMS data sizes and computing needs require a worldwide approach to Physics analysis. FNAL is US CMS national computing center. There is an "LPC CAF" at FNAL in addition.

Computing in the US

T0 at CERN, T1 at Fermilab as US CMS national center ("super" Tier 1 with twice the resources of other Tier1s). Keep many of the trigger streams at FNAL.

T2 at UCSD, Caltech, UFlorida, Wisconsin, MIT, Nebraska and Purdue as regional US CMS centers. (+ Brazil + ?) Not every country has a T1…



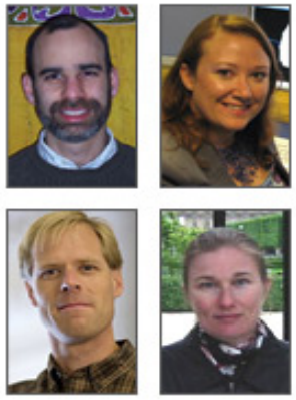
There are strong "T3" institutions springing up also.

The US CMS LPC

LPC

- LPC Calendar
- LPC Support
- LPC Communications
- Links
- LPC Documents
- LPC Organization

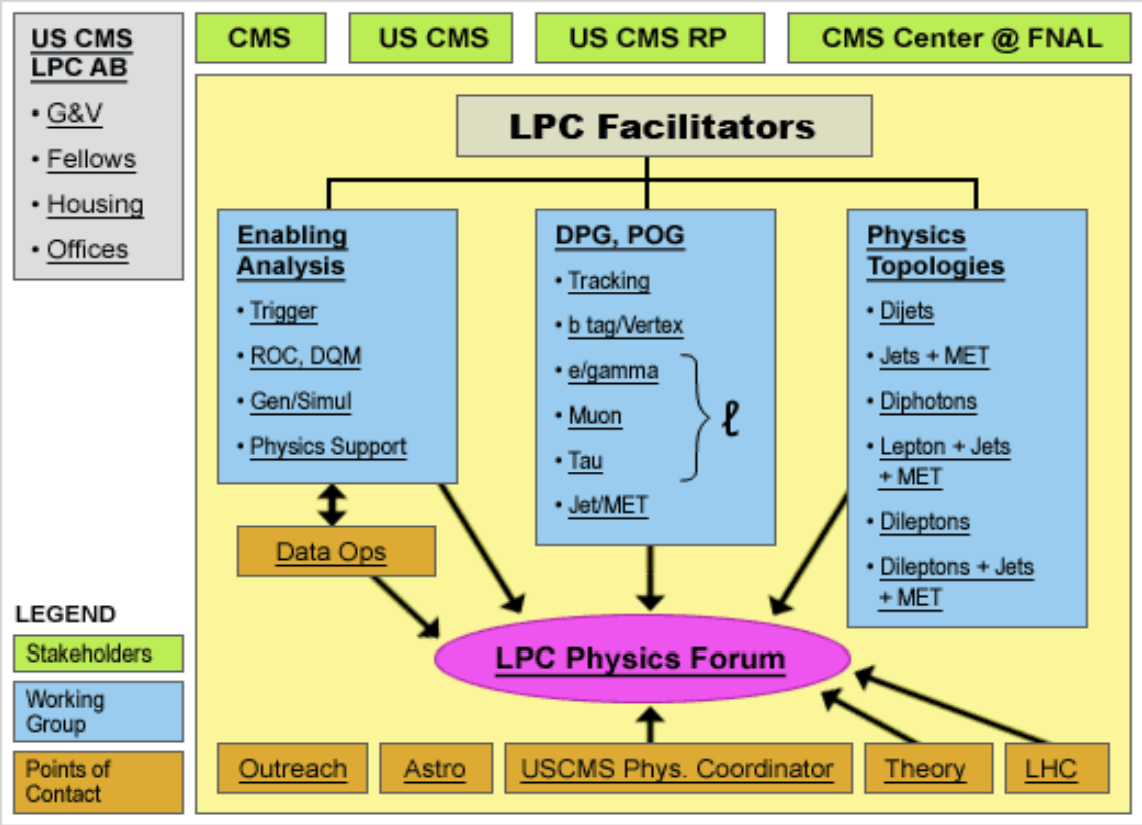
US CMS Blogs



Click photo to read author's blog

Today's Meetings

LPC Organization Chart:



LPC Mission Statement:

What is the LHC Physics Center?

Located on the 11th floor of the FNAL high rise, the purpose of the LPC is to ensure the US gives the strongest possible assistance to international CMS in software preparations for Day 1 and to enable physics analysis from within the U.S.

- a critical mass (clustering) of young people who are actively working on software (reconstruction, particle identification, physics analysis) in a single location (11th +10 + 9 floor of the high rise),
- a resource for University-based US CMS collaborators; a place to find expertise in their time zone, a place to visit with their software and analysis questions,
- a brick-and-mortar location for US-based physics analysis, with such physical infrastructure as large meeting rooms, video conferencing, large scale computing, and a "water cooler" for informal discussions of physics.

Resources: 11th Floor

- **Meeting Rooms/Video Conferencing/Internet**
- **terminals/printers/office supplies**
- **secretarial and computer support**
- **Coffee machines/Water cooler**

Common Areas

Meeting rooms

Transient space

LPC Meetings

- Advisory Board Meetings (7)
- CMS Software Tutorials (7)
- EDM/Tools (0)
- J + J (3)
- J + MET (7)
- JetMEt working group (42)
- L + J + MET (9)
- L + L + J + MET (0)
- L + L (14)
- Muon (30)
- Photons (11)
- Physics Forum (61)
- Simulation and Generators (51)
- TEV4LHC (1)
- Tau ID (33)
- Tracking (128)
- Trigger (55)
- University and Institute Group Meetings (17)
- Working Group Heads Meeting (22)
- Workshops (31)
- b ID (33)
- e-gamma (60)
- ALL US CMS Meeting (152)

LPC Work Plan

Concentrate on the fundamentals CMS will need to be ready with physics on day 1 – the LHC is a discovery machine:

- **calibrations and alignments - DPG**
- **particle identification algorithms - POG**
- **code certification/ data quality control - DQM**
- **physics preparations - PAG**

Will bring our experience from currently running experiments to these tasks.

Getting an account at FNAL

http://www.uscms.org/scpages/general/uaf/accounts.html

There is a “help desk” on WH11E (Patrick Gartung)

Many experts sit on WH11 who can help you with detailed detector or software issues (see the LPC talk)

There is an enormous amount of information available. Do not get overwhelmed. There is also a large number of folks at the LPC who will help you get started.

Computer Help

Patrick Gartung – first line of defense

system administration of the Linux PC's at the LPC and the ROC

- all common login PC's and some university PC's

user support for

- Windows and Linux laptops at the LPC
- accessing the UAF resources from the LPC and universities
- the video conference rooms at the LPC
- running CMS software
- setting up the PC's and video conference equipment in the ROC
- developing software configurations for new Linux desktop installations

Contact with Theorists – WH3E

Theoretical Physics Department

Contacting Us - Directory - Fermilab: Home - At Work - Phone Book

Theory Department Activities

- New Phenomena Group.

Chicago Area Physics Seminars

Joint Experimental-Theoretical Physics Seminar. Fridays at 4:00 PM in 1 West.
Colloquium. Wednesdays at 4:00 PM in 1 West.
Theory Seminar. Thursdays at 2:30 PM in Curia II.
Fermilab Seminars: NALCAL, Astrophysics Seminar.
Argonne seminars: HEP, lunch, Theory.
U. of Chicago Physics: Colloquia and EFI seminar page.

Conferences

- Lepton Photon 2003
- Lattice 2004
- International Conference on Future Hadron Colliders, Physics, Detectors, Machines
- Bill Bardeen Symposium, 9/23-24/2005

Workshops

Physics at Run II Workshops: SUSY/Higgs, Top Quark, New strong dynamics, QCD and Weak Bosons, B Physics, Monte Carlo Generators.

The Future of Higgs Physics
Lattice QCD with Commodity Clusters
Nu Horizons: Neutrinos Off the Axis
Heavy Quarkonium

Physics Information

- Fermilab Library: online catalogue.
- arXiv.org
- SLAC Spires: HEP database, home.
- Organizations: AAS, AIP, AMS, APS, Argonne HEP, BNL, CERN, DESY, DOE, HEPIC, NSF, Particle Data Group, US-HEPFOLK, HEP names, SLAC, other HEP organizations.
- News: APS What's New, FYI, FNAL electronic journals, Google, Yahoo

Because we are starting at a discovery machine, tighter coupling to the theory community will be very desirable.

Lenny Spiegel is the LPC liaison, joint seminars LPC/Theory

Interactions with CMS

The LPC is fully synchronized with the CMS Physics Coordinator by way of liaison in the EB

The LPC has close ties to the Computing, Software and Physics Coordinators of the EB

The LPC Group Leaders act as mentors for US groups who choose to nucleate at the LPC to begin a physics analysis. They are not PAG leaders.

Impact of LPC

Although not formally commissioned until early 2005, LPC scientists have had a big impact on CMS. Tevatron experience is a key!

Review of software framework (CMSSW) led to overhaul, and increased placement of U.S. scientists in management positions.

Location at Tier 1 means the LPC is a place where interfaces between M&O (detectors) and S&C (analysis code) can be worked out, with many meetings to make coherent the efforts of both.

2005: concentration on the physics-enabling environment and reconstruction tools. Aspects ranging from muon identification to trigger tables to jet calibration.

2006: moving closer to physics analyses, via the path of understanding the detectors during the cosmic challenge and test beam.

2007: prepare robust tools for trigger, calibration and alignment.. Work on global runs in UX. Begin to establish POG. Create efforts on physics studies in synch with CMS organization.

2008: 14 TeV physics – must be ready to rediscover the SM with "standard candles" and then rapidly move toward the search for new physics..

CMS FNAL Remote Operations Center

LHC @ FNAL Remote Operations Center

The CMS Remote Operations Center at Fermilab is located in Wilson Hall. The FNAL ROC provides a suite of software tools for accessing, processing and analyzing various types of local and remote CMS data. In 2006, CMS physicists working from the FNAL ROC participated in real-time data monitoring with the Magnet Test and Cosmic Challenge. In 2007, shift duties for the Silicon Tracker Slice Test and the next phase of the Magnet Test will be performed from the FNAL ROC. For the LHC collider run beginning in 2008, CMS shifts will be taken at the FNAL ROC to complement shifts at CERN, and remote monitoring will continue to improve with automation and new tools such as trigger, luminosity and data acquisition.

ROC	WBM	ELog	Mailing List	Meetings	Presentations & Notes
	nippon.fnal.gov	WebCams	Runs	CVS	MTCC
	LHC@FNAL	Snapshot Service	LHC@FNAL Console Map		
	CMS Workbook	Accounts & Nodes	Directories / Glossaries	New User Instructions	Quick Guide
		WH11 Floor Plan	Photos	VRVS / ESnet	Google / Wikipedia
SiTracker	ELog	Meetings	RunSummaryTIF	Process Summary	EventProxyTIF
	Data Analysis	DCS	Event Display	PhEDEx Transfer	Running DQM
	DBS Data Discovery				
LPC	CERN CVS	Computing	dCache	Linux PC Inventory	
	LPC at Work	Maintenance & Operation	Meetings / Rooms	News	Photo Gallery
	Remote Analysis Builder	Resources Grid	Software Environment	Software Releases	
CMS	Page 1	Agendas / Map / Daily	CMS Times	HyperNews	Simba
	CMS Helpdesk	CMS Centre	CMS Notes	CMSSW	CPT
	CVS / LXR	Data Management	DQM	Event Display	WebCams 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / SX5
	Event Filter	Framework & EDM	Luminosity	Online Selection	Savannah
	Software	Storage Manager	Timing & Control	Trigger & DAQ	TWiki
	Controls / Safety	ECAL	Electronics	Tracker	XDAQ
LHC	Accelerators & Beams	Dashboard	Experiments	Outreach	Webcams
CERN	Bulletin / Courier	Document Server	Information Technology	Site Maps	Users' Office
Fermilab	All Exp Mtg	Beam Status	Computing	List Server	Seminars
	Today	Training	Users' Office	Weather	VMS

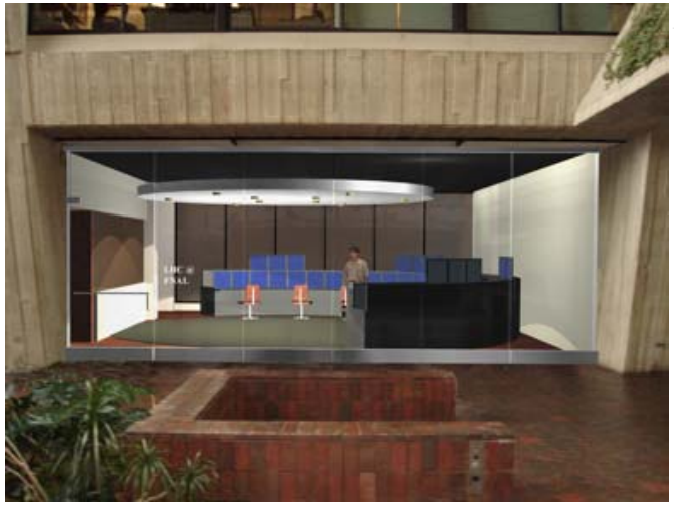
LHC@FNAL – WH1E

http://cd-amr.fnal.gov/remop/remop.html

Fermi National Accelerator Laboratory

LHC@FNAL Remote Operations Center

LHC@FNAL will be used to support commissioning and operations of the Large Hadron Collider (LHC) and the Compact Muon Solenoid (CMS) experiment at CERN. The goal is to give CMS and accelerator scientists and engineers remote access to capabilities that are available in control rooms at CERN, and to serve as a communications conduit for members of the LHC community in the US.



E. Gottshalk and P. McBride

Conclusions

- **The LPC is an essential part of US CMS' strategy for doing physics analysis**
- **The LPC (ROC – service work, shifts) has been embraced by the US CMS physics community**
- **The LPC has had a substantial impact on both US CMS and CMS**
- **The LPC provides a mechanism for contact to the theory community – especially the FNAL theory group.**