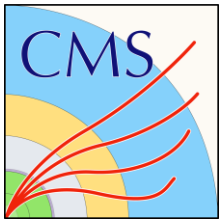



# CMS Communications

July 2015

# What communications?

- Outreach
- Education
- Internal

In coordination with Spokesperson and CB Chair

# How?

- Small dedicated team supported by CMS and CERN
  - Currently 3 people
- Several/many regular contributors
- Regular weekly CMS weeks meetings open to interested people
  - Present projects
  - Share ideas
  - Prepare for special events

# Activities

- WORK PACKAGE 1: Information Systems
- 1.1 Public website
  1.2 DocDB
- WORK PACKAGE 2: Education and Outreach
- 2.1 Public communication
  2.2 Media inquiries
  2.3 Print/digital
  2.4 Multimedia production
  2.5 Visits P5
  2.6 Virtual Visits
  2.7 Data for public/education
  2.8 Local Events
  2.9 Art@CMS
  2.10 Products
  2.11 Souvenirs
- CMS Communications Work Packages Breakdown can be view here

# Service work

| Project | Activity | Task | Months |
|---|---|---|---|
| General | Commun | Communications Infrastructure | 18 |
| General | Commun | Information Systems - Design new public web site on CERN platform | 3 |
| General | Commun | Information Systems - New public web site content migration | 3 |
| General | Commun | Information Systems - DocDB maintenance | 2 |
| General | Commun | Education and Outreach - Open Data applications | 4 |
| General | Commun | Education and Outreach - Comic book | 3 |
| General | Commun | Education and Outreach - Visitors feedback | 1 |
| General | Commun | Education and Outreach - Posters translation | 1 |
| General | Commun | Education and Outreach - Masterclass pack for teachers | 1 |
| General | Commun | Education and Outreach - CMS pack | 2 |
| General | Commun | Education and Outreach - CMS pack pdf | 1 |
| General | Commun | Education and Outreach - CMS pack apps | 1 |
| General | Commun | Education and Outreach - CMS pack translation (1w/language) | 2.5 |
| General | Commun | Education and Outreach - Virtual Visits guide for remote sites | 1 |
| General | Commun | Education and Outreach - Virtual Visits guides (1d/visit, 2d/week-ends) | 6 |
| **Total** | | | **49.5** |

# Print/digital

Initative of the CMS Collaboration Board

Three core CMS pillars:

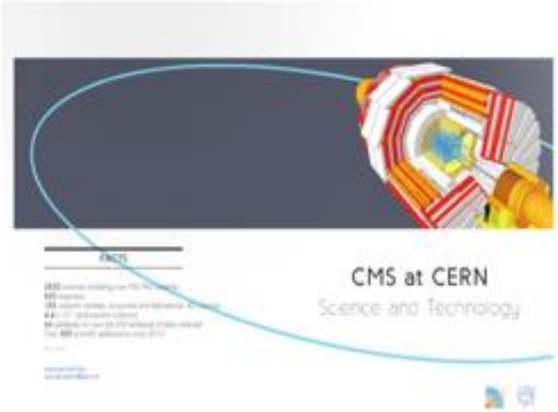
1. Science and Technology
   (produced May 2014)

2. Fundamental Physics
   (in progress)

3. Worldwide Collaboration
   (in progress)

# Target audience

- General Public
- Decision makers
- Students, Teachers, …


CMS at CERN
Science and Technology


CMS at CERN
Fundamental Physics


CMS at CERN
Global Collaboration

## Posters

14 A0 posters

**11 CMS languages**
(in DocDB):
EN/FR, English, French, Finnish, German, Greek, Serbian, Turkish, Bulgarian, Portuguese, Hungarian, Spanish, Italian

4 languages in the pipeline: German, Malay, Thai, Persian

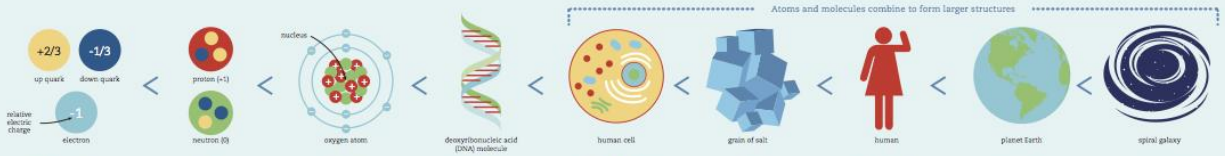
**Target audience:**


- General public
  - Exhibition visitors
    - Used on CERN 60 anniversairy local events (Bulgaria, Italy, France, Finland, Hungary, Turkey)
- Students
  - Preparatory material before Virtual VisitsCMS Institutes.
- CMS Institutes
  - possibility to print locally


Would you like to translate the posters into your language? Contact us!

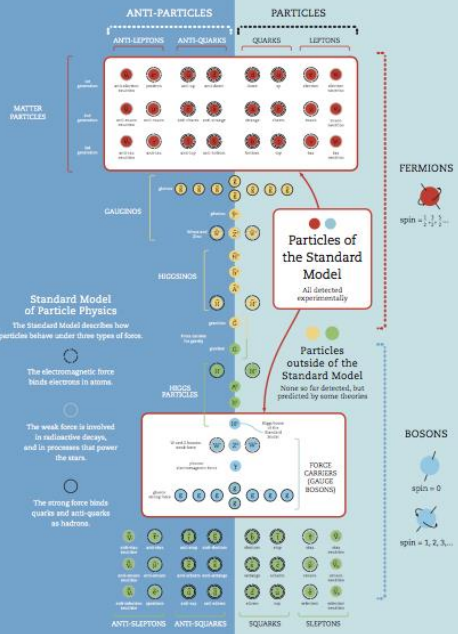
# How the world is built

All everyday objects seem to be made from just three types of basic building block – the up quark, the down quark, and the electron.




## Particle Universe

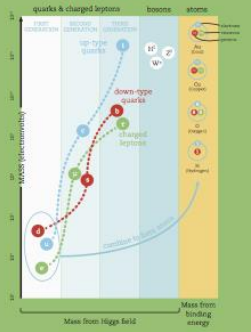
Elementary particles, objects with no detected structure, include quarks, leptons, force carriers, and the Higgs boson.




## Mass and the Higgs boson

Elementary particles acquire mass through interactions with an energy field, where the Higgs boson acts as energy carrier.


### Particle Masses




**2012**
ATLAS and CMS experiments: First detection of Higgs boson

**1983**
UA1 and UA2 experiments: First detection of W⁺ and Z⁰

**1972**
Gerard 't Hooft and Martinus Veltman: Mathematical consistency of electroweak theory

**1967**
Abdus Salam and Steven Weinberg: Mass mechanism applied to quarks and leptons

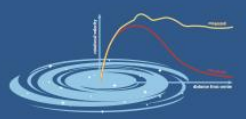
**1964**
Robert Brout and François Englert; Peter Higgs; Gerald Guralnik, Carl Hagen and Tom Kibble: Mass mechanism for W⁺ and Z⁰

**1961**
Sheldon Glashow: Electroweak theory for W⁺ and Z⁰ of zero mass

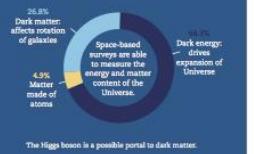
## Beyond the Standard Model

**The Standard Model successfully describes a wealth of experimental data, but seems to explain only 5% of the Universe.**

### Dark matter and dark energy



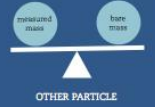

Measured rotational velocities far from a galaxy's centre are higher than calculated from the distribution of visible matter.



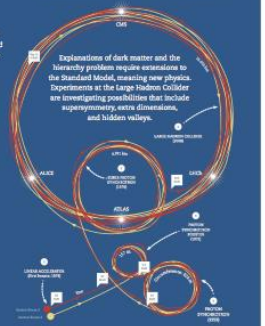

The Higgs boson is a possible portal to dark matter.

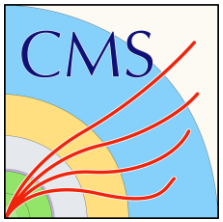
### Hierarchy problem

The measured mass of an elementary particle can be regarded as the sum of a bare mass and a self-energy. The bare mass is from interaction with the Higgs field, and the self-energy is from emission and reabsorption of other particles. For the Higgs boson, the calculated self-energy implies an enormous difference between measured mass and bare mass. This is known as the hierarchy problem.


### Searching for new physics






# Public communication

# News articles

- Timely stories about key CMS topics:
  - Scientific results
  - Engineering activities
  - Awards
  - Outreach events
- Two “streams”
  - Physics
  - General
- Example: http://cern.ch/go/RKq9

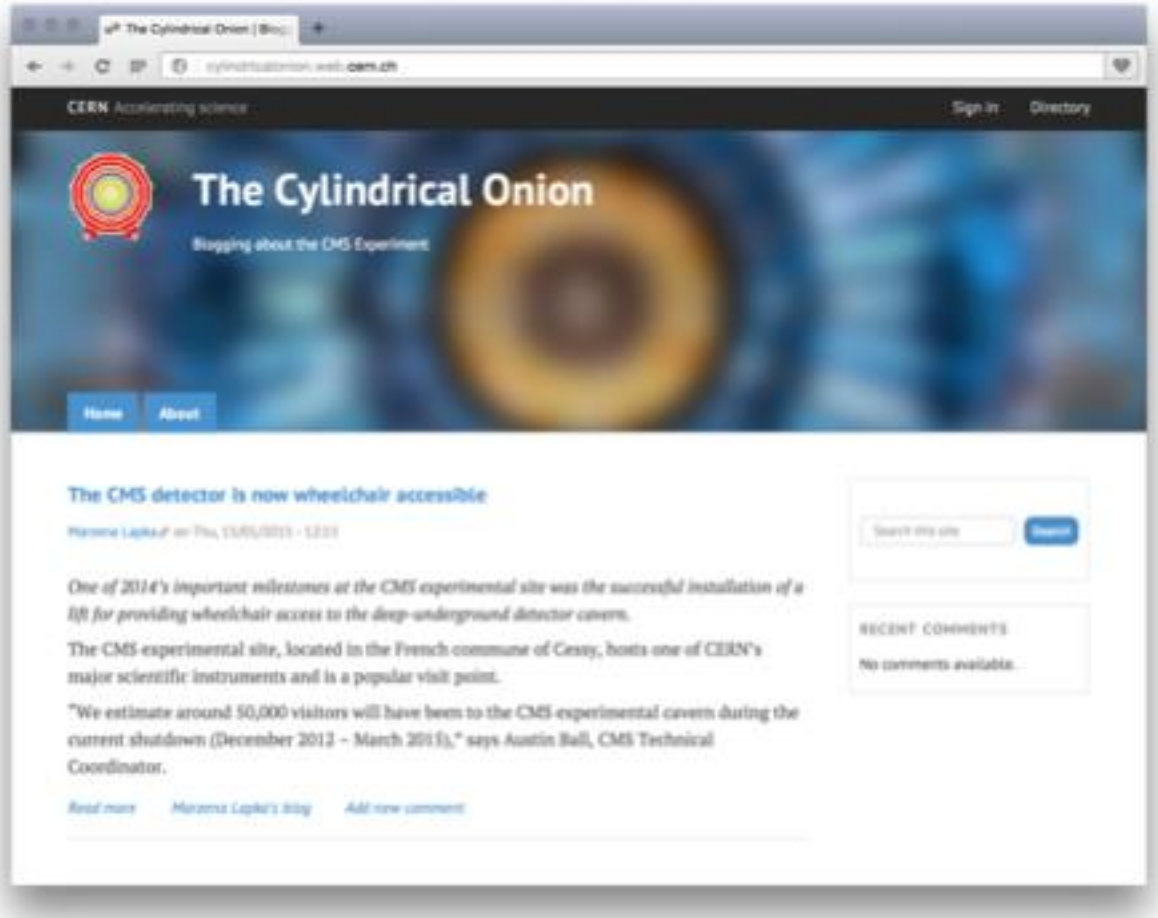
# Official Statements

- Major CMS announcements
  - New physics results
  - Updates from major conferences
  - LHC milestones
    - First beam
    - First collisions at 7 TeV
    - …
- Usually related to a CERN press release
- Translations often produced
- Example: http://cern.ch/go/7LMT

# How can YOU contribute?

- Story ideas for the public
  - Inform us of results, events etc.
  - Give enough notice for key milestones well in advance
  - Photographs
    - Send us those you take
    - Contact us to take photographs for you
- Statements: Translations
  - List of volunteers not updated in a while
  - Volunteer if interested!

# cern.ch/cylindricalonion

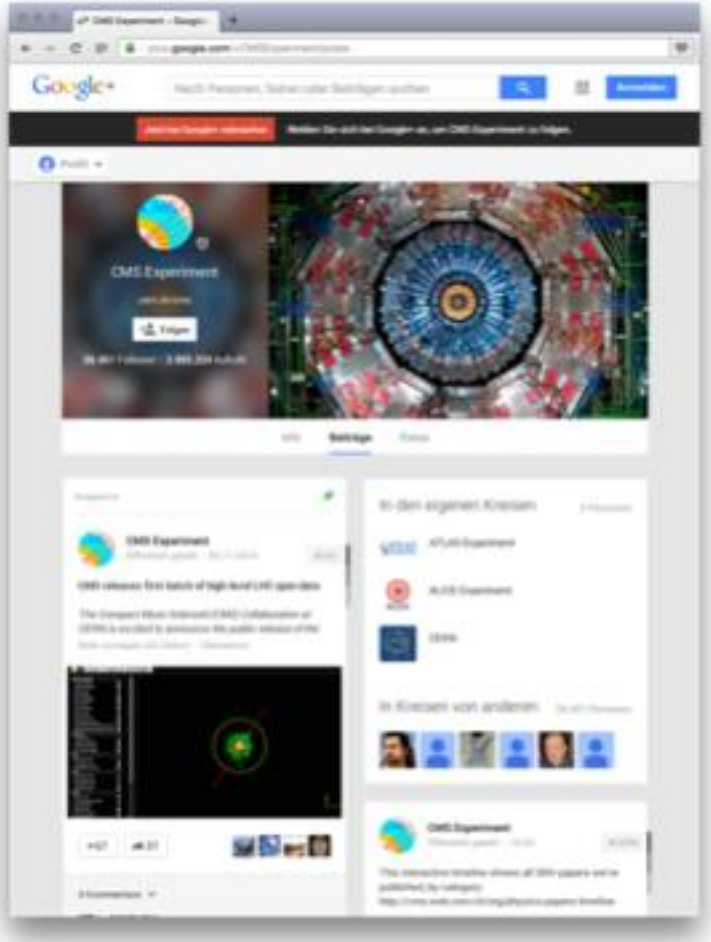


# How can YOU contribute?

- Contact us if you want to provide short, fairly regular updates on:
  - your research area
  - conferences
  - technical work at CMS
  - outreach events you organise / participate in

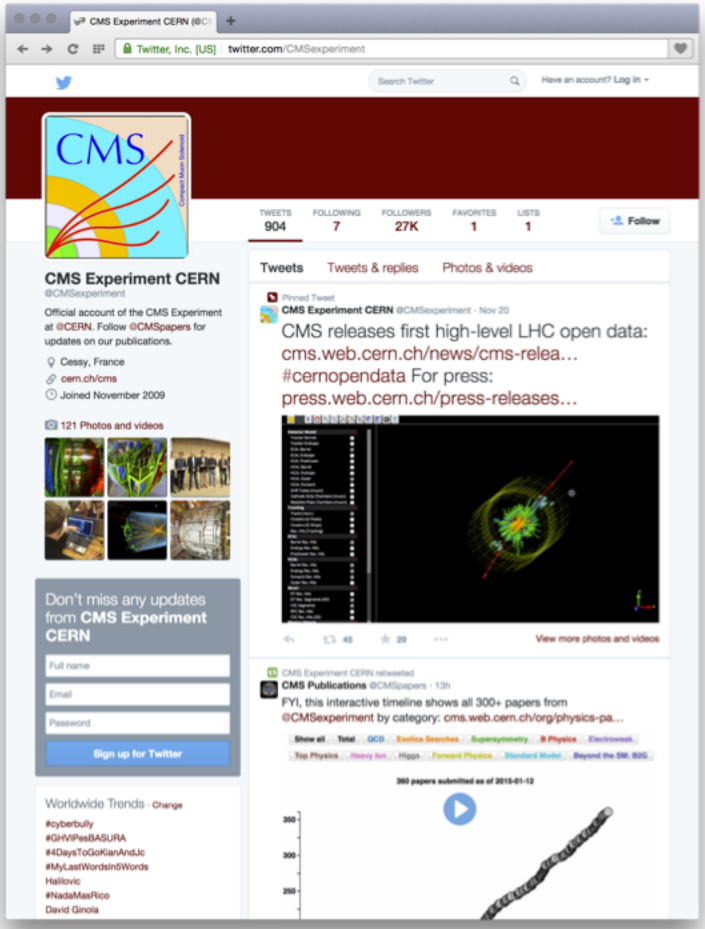
## fb.com/CMSExperiment


## google.com/+CMSExperiment



# Twitter

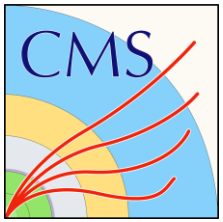
## twitter.com/CMSExperiment



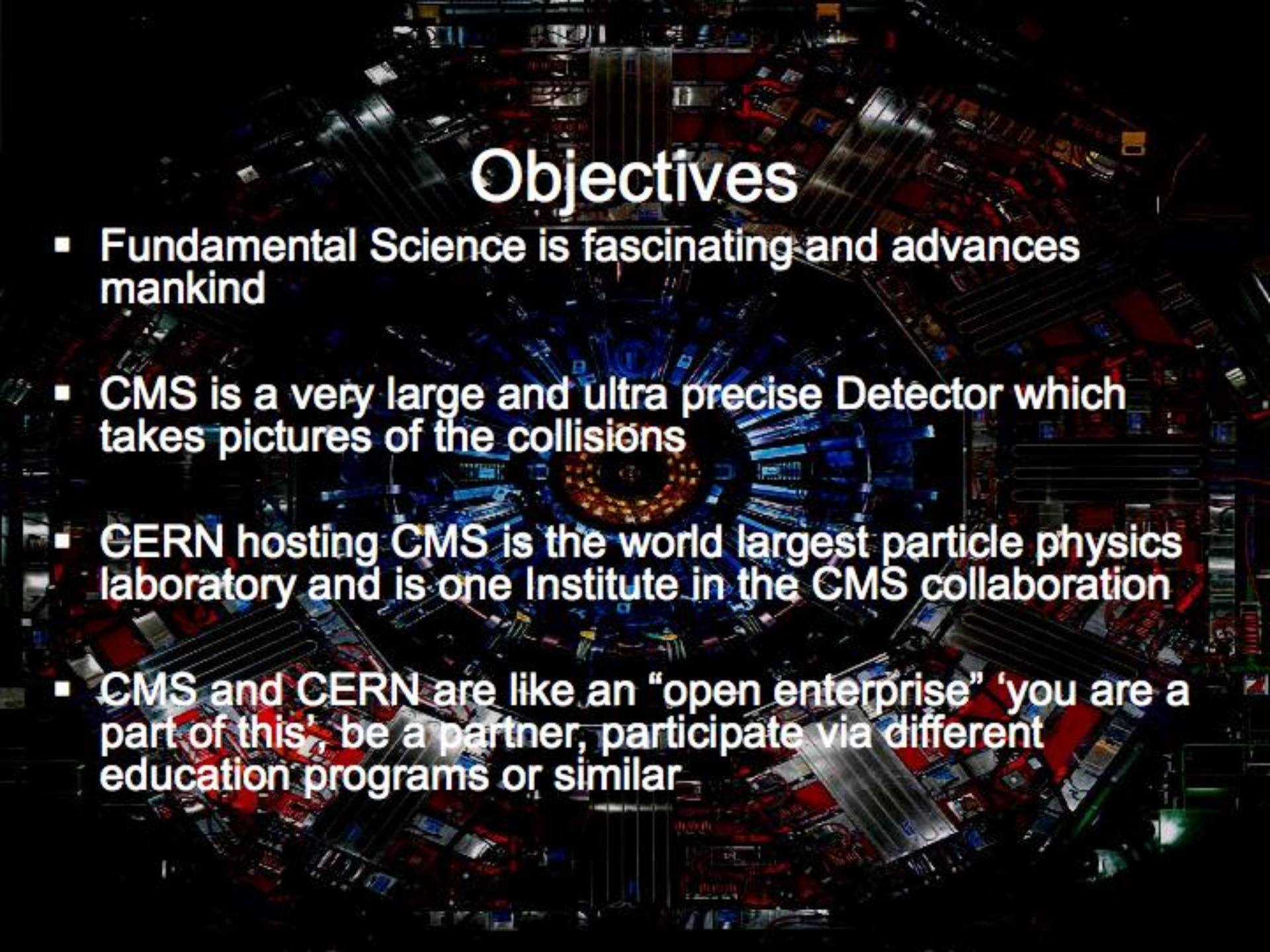

## twitter.com/CMSpapers

# How can YOU contribute?

- Do you use Quora / reddit / Tumblr / …?
  - Have you come across (or yourself produced)
    - a clear explanation,
    - piece of trivia,
    - CMS-inspired work?
- Follow the official CMS channels and re-share content




# Visits

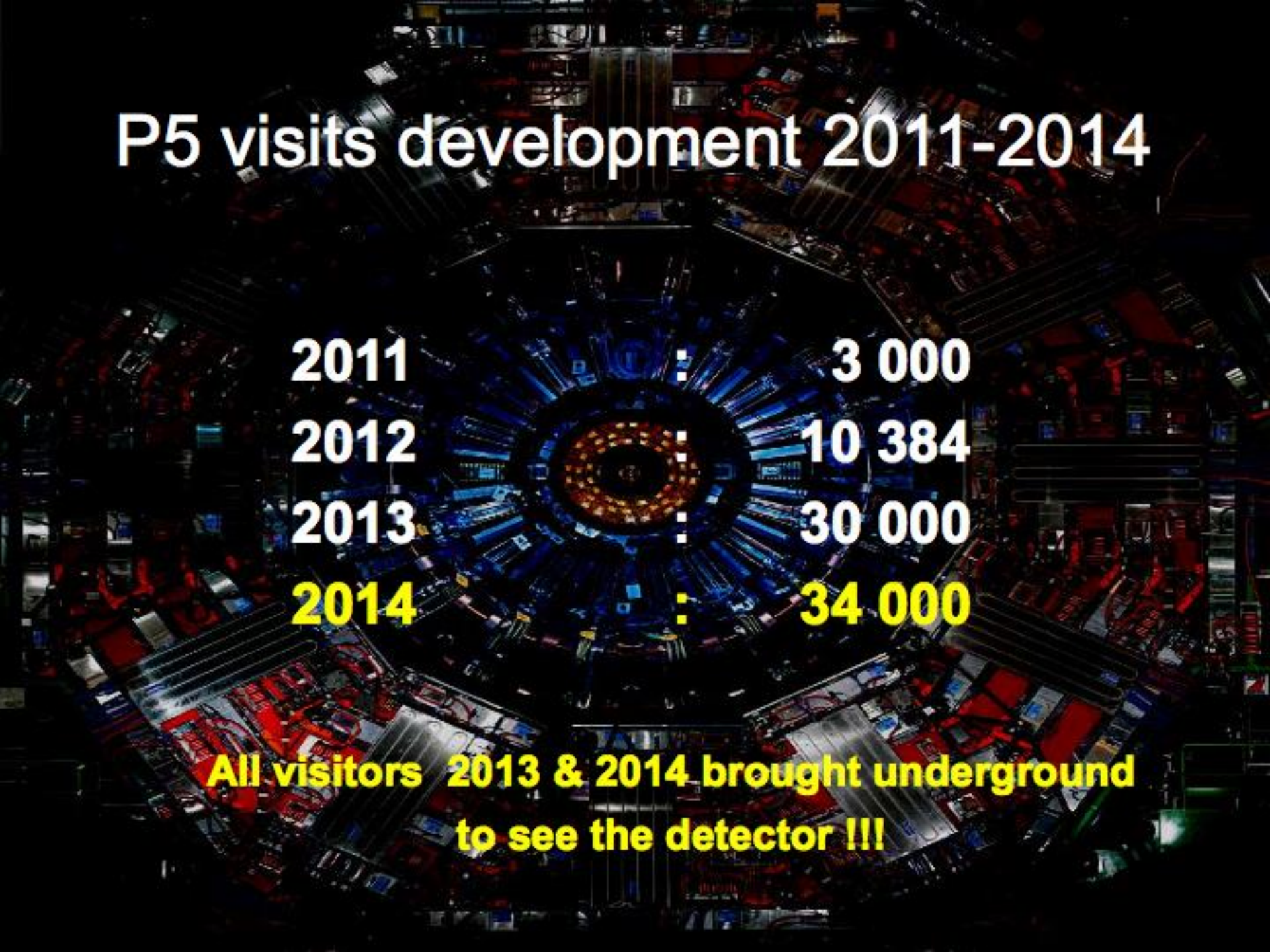


# Objectives

- Fundamental Science is fascinating and advances mankind
- CMS is a very large and ultra precise Detector which takes pictures of the collisions
- CERN hosting CMS is the world largest particle physics laboratory and is one Institute in the CMS collaboration
- CMS and CERN are like an “open enterprise” ‘you are a part of this’, be a partner, participate via different education programs or similar

# Target Audience


1) NON – expert public  2) students/ teachers/…  3) VIP/Press


P5 visits development 2011-2014
2011 : 3 000
2012 : 10 384
2013 : 30 000
2014 : 34 000
All visitors 2013 & 2014 brought underground
to see the detector !!!

# What is CMS Virtual Visit?

Video connection between CMS CR and CMS Experimental cavern and remote locations.

Opportunity to:

- see the CMS Experiment (or other installations)
- discuss with a CMS scientist (in native language)

… no travel expenses

Photos: http://tinyurl.com/neqftye

# CMS Virtual Visits






bringing high-energy physics straight to you


ONLY 5 months (September 2014 – February 2015)

- 17 countries
- 4 500 participants
  - 2 800 students
  - 1 700 general public

Many more ahead of us!

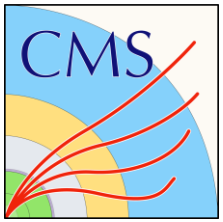
This map is available at:
http://cms.web.cern.ch/content/virtual-visits

# If you wish to become involved..

- Organise Virtual Visit @ your institute/conference/exhibition/event

- Become a part of the Virtual Visits crew
  - Technical team (help Noemi and Zoltan)
  - Virtual Guide

Contact us: cms-communications-team@cern.ch




# Art@CMS

# Objectives

- Reach out to and engage citizens, especially the youth, in science, HEP, CMS & CERN
- Empower CMS institutes and scientists to participate in dialogue with society
- Enhance the public image of CMS & CERN and their contribution to education & society

## Art@CMS exhibitions

Increase CMS visibility by:

- Attract artists or university art departments to work on a CMS/HEP topic
- Connect them with local CMS institutes to create original artworks in various mediums
- Organize exhibitions both at P5 and CMS institutes, schools, exhibitions, etc.
- ***Use art as catalyst for citizens' engagement with science***

Chris Henschke, Wolfgang Adam  Paco Falco, Pierluigi Paolucci

### Chris Henschke, Wolfgang Adam

Collaboration Statement

Chris Henschke is a Melbourne-based artist who has been working with digital media since the late 20th century. His main areas of practice are in the experimental combining of sound and image, space and time, and art and science.

Wolfgang Adam is senior physicist responsible for CMS data analysis at the institute of High Energy Physics in Vienna, Austria. He has been working for the CMS experiment for 15 years and he is deeply involved in searches for supersymmetry.

ICHEP 2014

# Art@CMS exhibitions

23 exhibitions

9 countries

~40,000 visitors

## Science&Art@School

Designed to help students:

- Understand and appreciate how scientific research in HEP, CMS and CERN works
- Think creatively and critically about the collaborative scientific effort in CMS and HEP
- by engaging in creative activities inspired by big questions driving research in CMS and HEP
- ***to develop positive attitudes towards STEM subjects***

07-09 Apr 2014 | Graz, Austria

07-09 Apr 2014 | Graz, Austria

### High energy physics meets art

**Participating schools:**
Graz International Bilingual School (GIBS) & BORG Monsberger
**Participating CMS Institute:**
Institute of High Energy Physics Vienna (HEPHY)
**Workshop co-ordinator:**
Michael Hoch (CMS/CERN)
**With the support of:**
Joanneum Universal Museum, City of Graz & Pathway Project

**RESOURCES**

Workshop programme

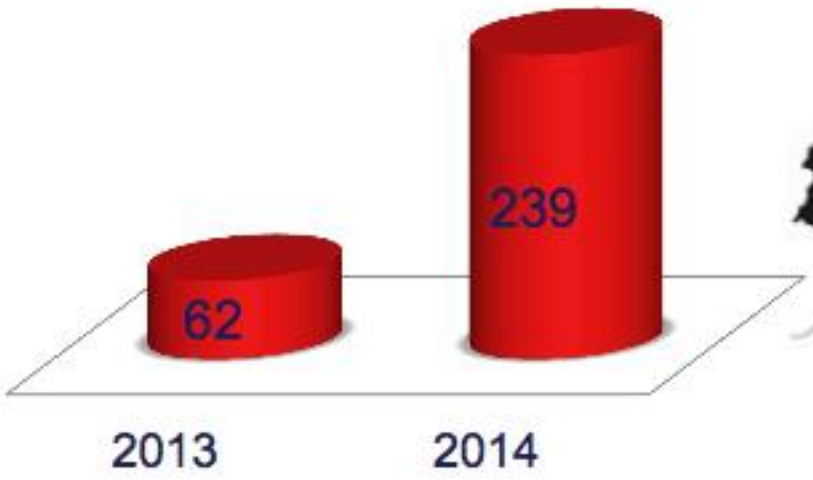
For the second consecutive year, Art@CMS goes to Graz, Austria, to run a Science&Art@School workshop, bringing together 55 high-school students from two high schools – Graz International Bilingual School (GIBS) & BORG Monsberger – with the aim to inspire them in the world of scientific research

# Science&Art@School

9 workshops

5 countries

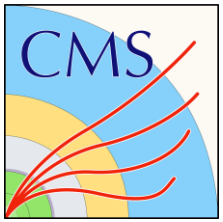
301 students





1 in Rwanda

# www.cern.ch/artcms




# Questions?