



#askCERN

Hangout with CERN and Google Science Fair: Snapshots of the Invisible

21 February 2013







SUISSE
FRANCE

CMS

LHCb

ATLAS

CERN Meyrin

CERN Prévessin

SPS 7 km

ALICE

LHC 27 km

Global Effort → Global Success

Results today only possible due to
extraordinary performance of
accelerators – experiments – Grid computing

Observation of a new particle consistent with
a Higgs Boson (but which one...?)

Historic Milestone but only the beginning

Global Implications for the future

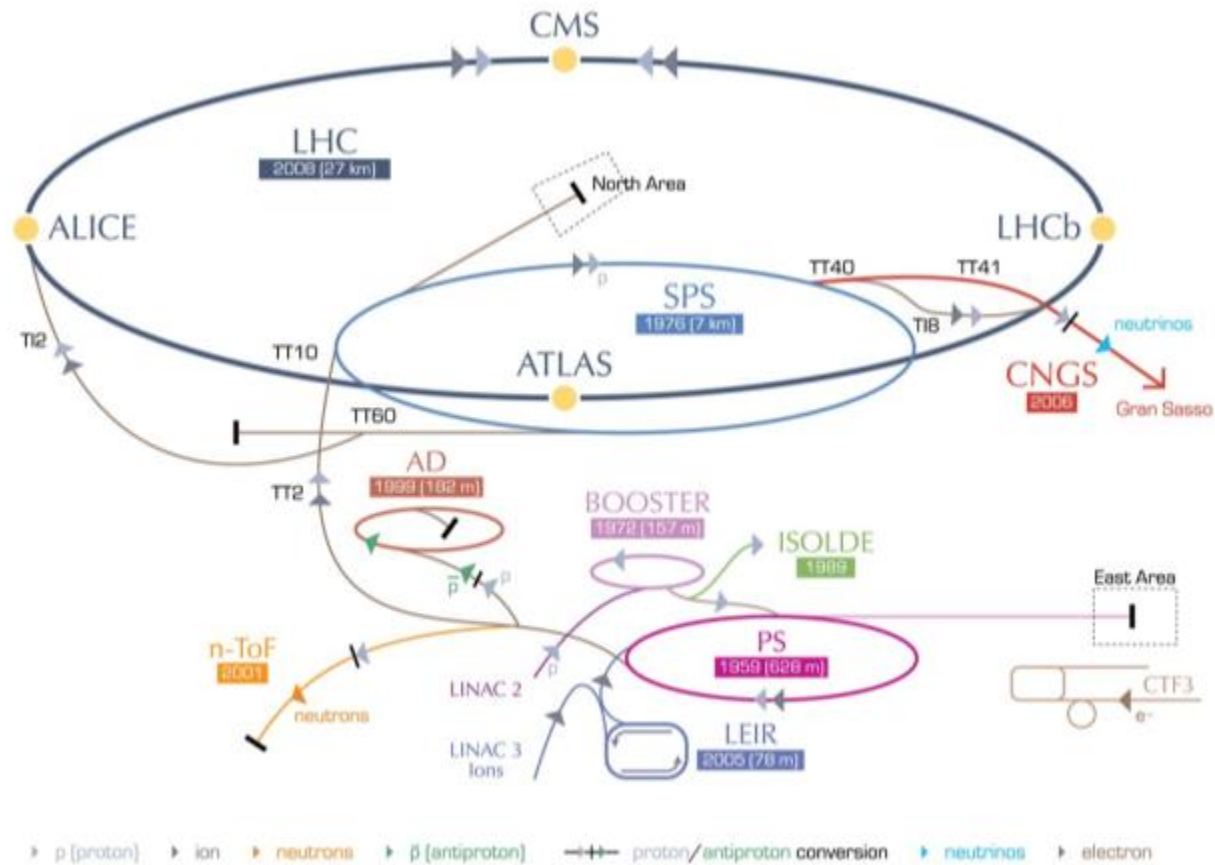




Today's trivia question

- Last 4 July, ATLAS and CMS witnessed about **500 trillion** proton collisions and observed a **few hundred** Higgs candidates (about **1 in 10^{12}**).
- If the LHC had produced **1 Googol** of proton collisions and the experiments had maintained the same efficiency, how many Higgs candidates would they have gathered?
- For extra credit, how many **tonnes** of Higgs would they have collected?

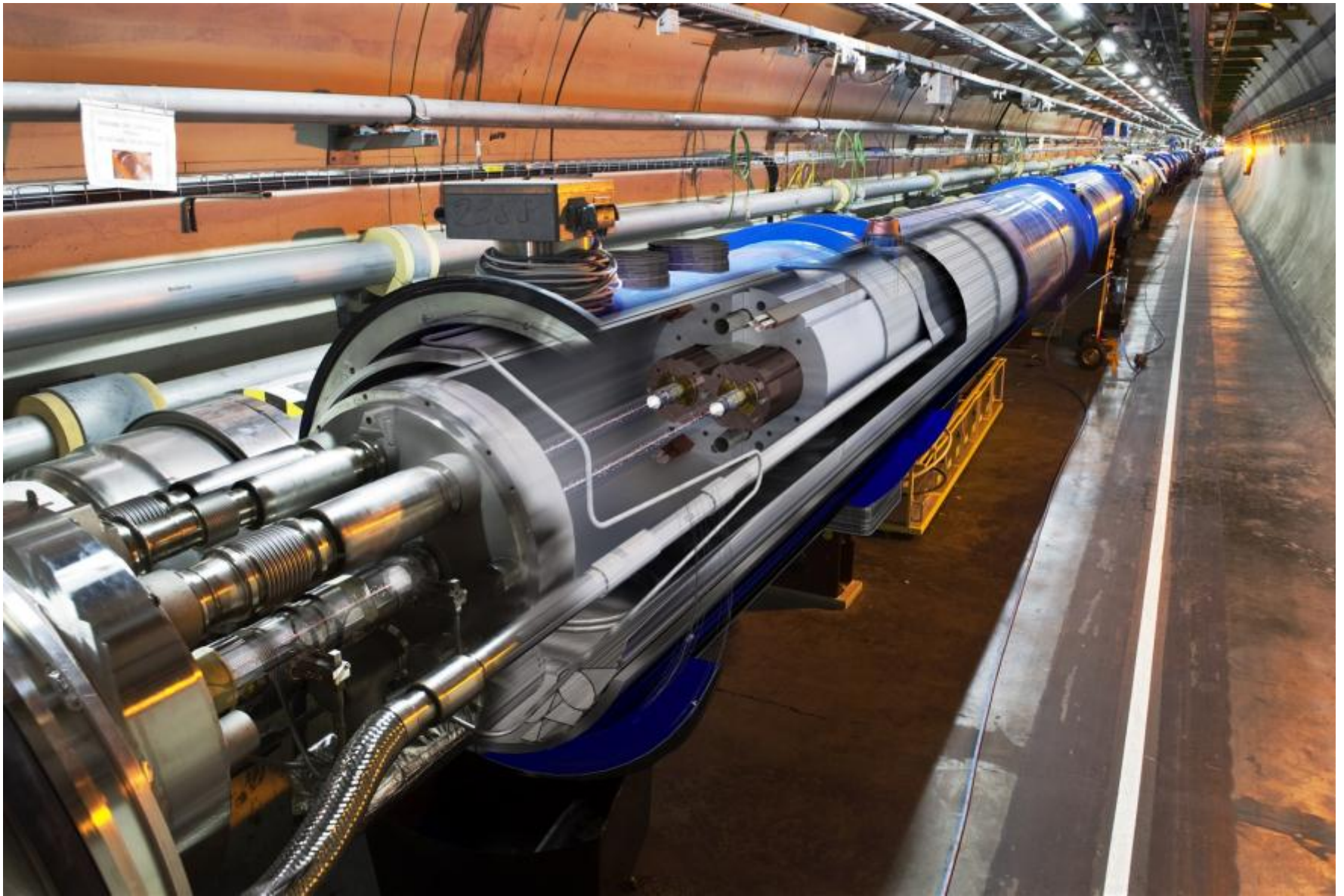
CERN's Accelerator complex

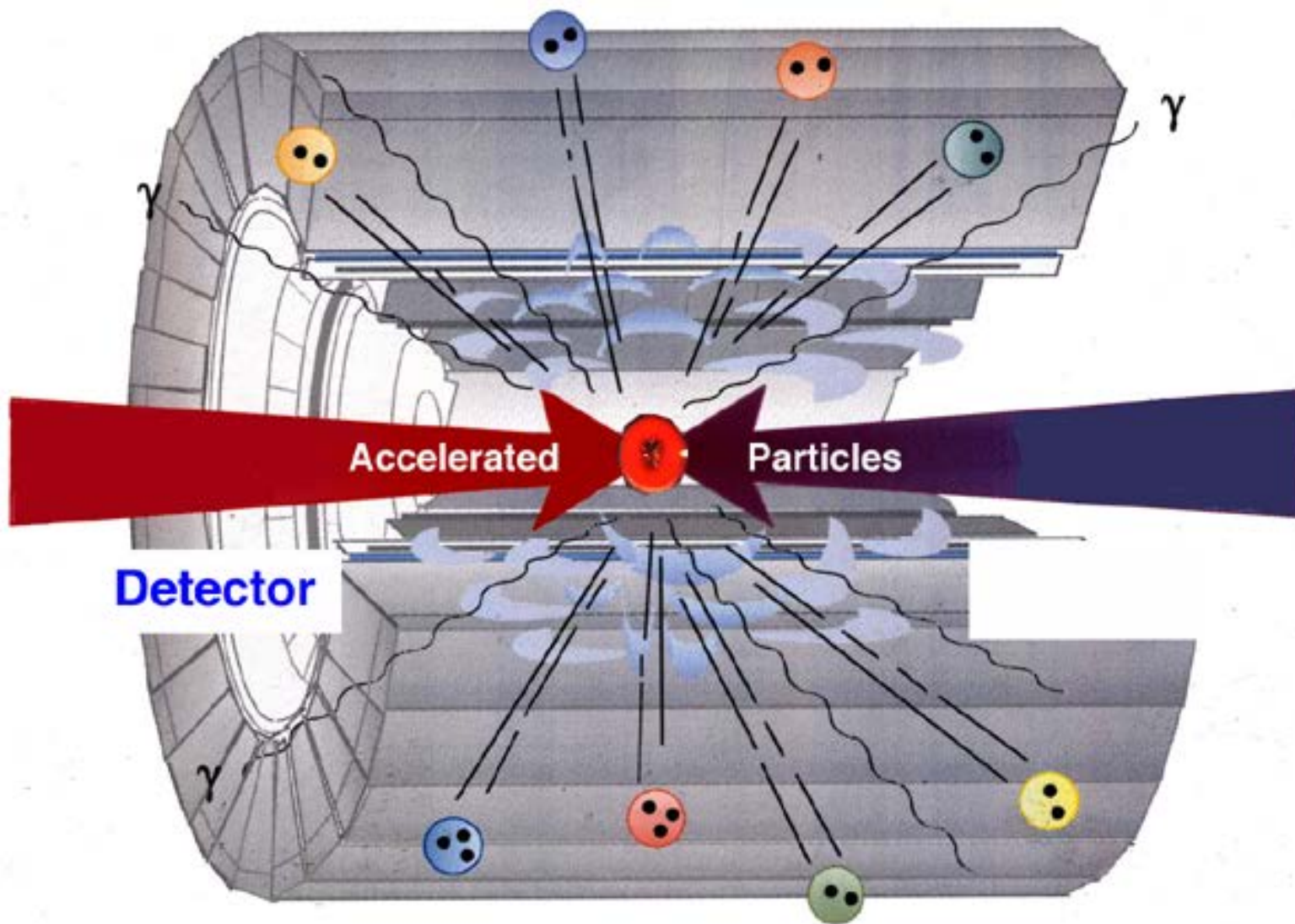


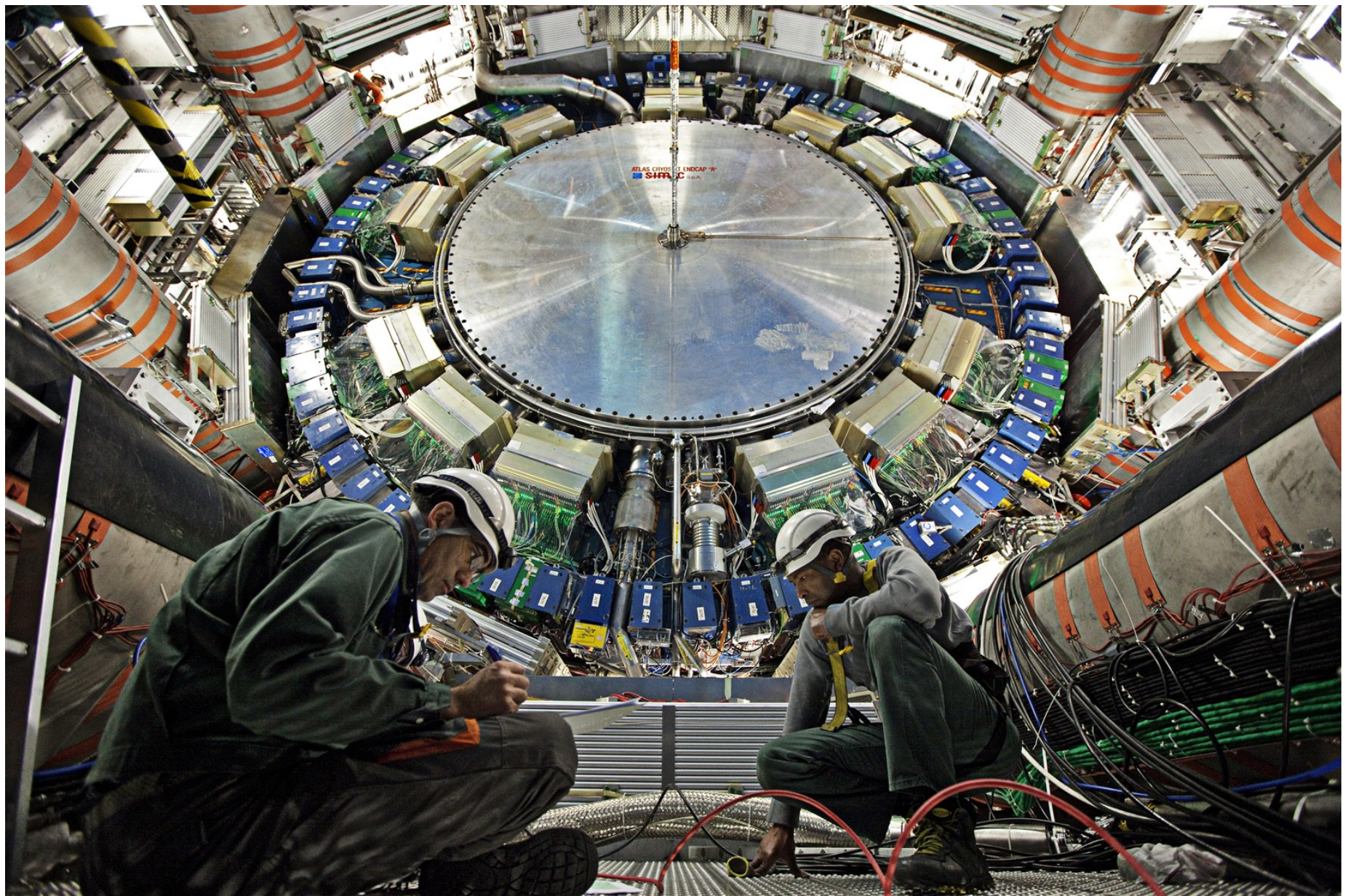
LHC Large Hadron Collider SPS Super Proton Synchrotron PS Proton Synchrotron

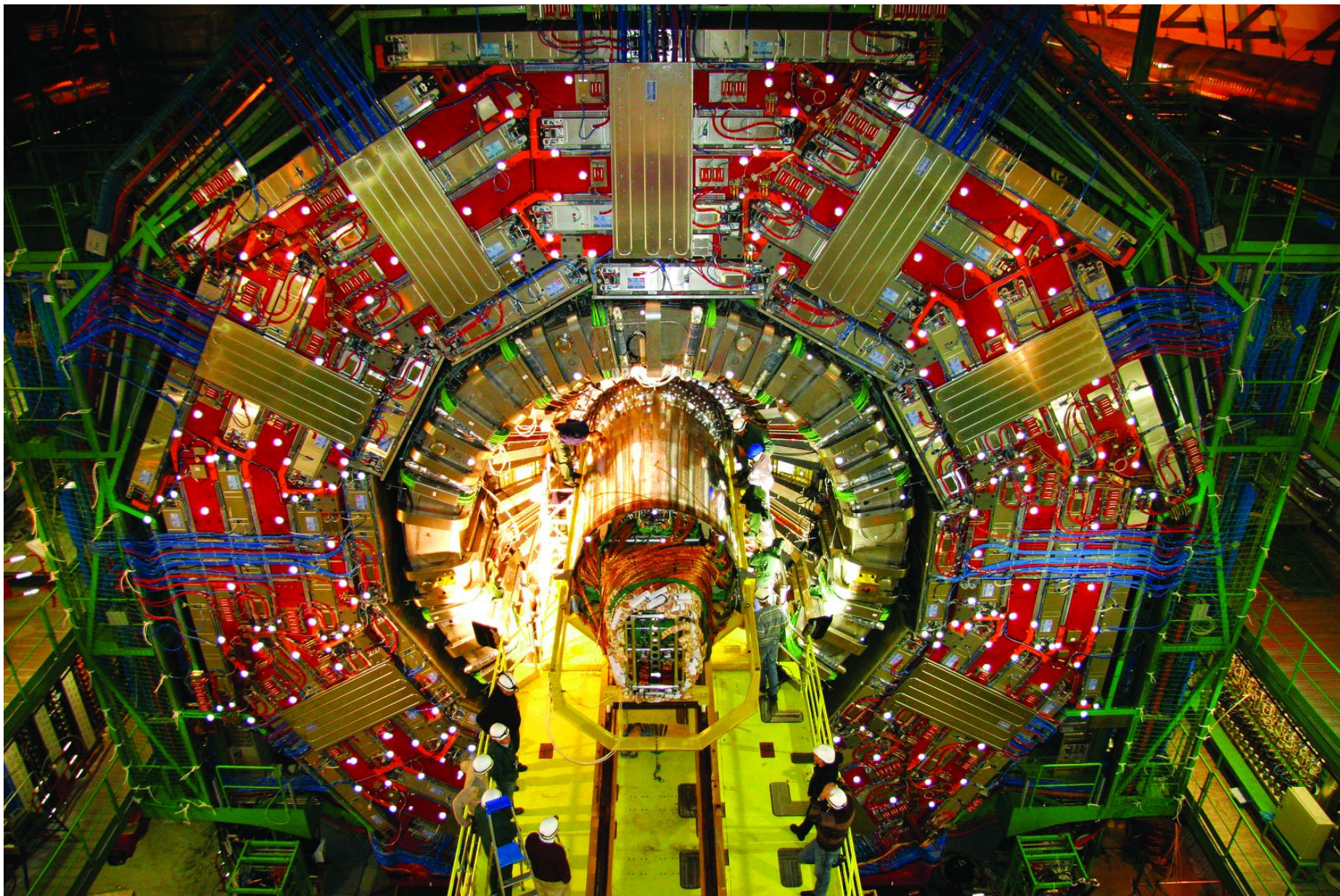
AD Antiproton Decelerator CTF3 Clic Test Facility CNGS Cern Neutrinos to Gran Sasso ISOLDE Isotope Separator OnLine DEvice
LEIR Low Energy Ion Ring LINAC LINEAR ACCELERATOR n-ToF Neutrons Time Of Flight

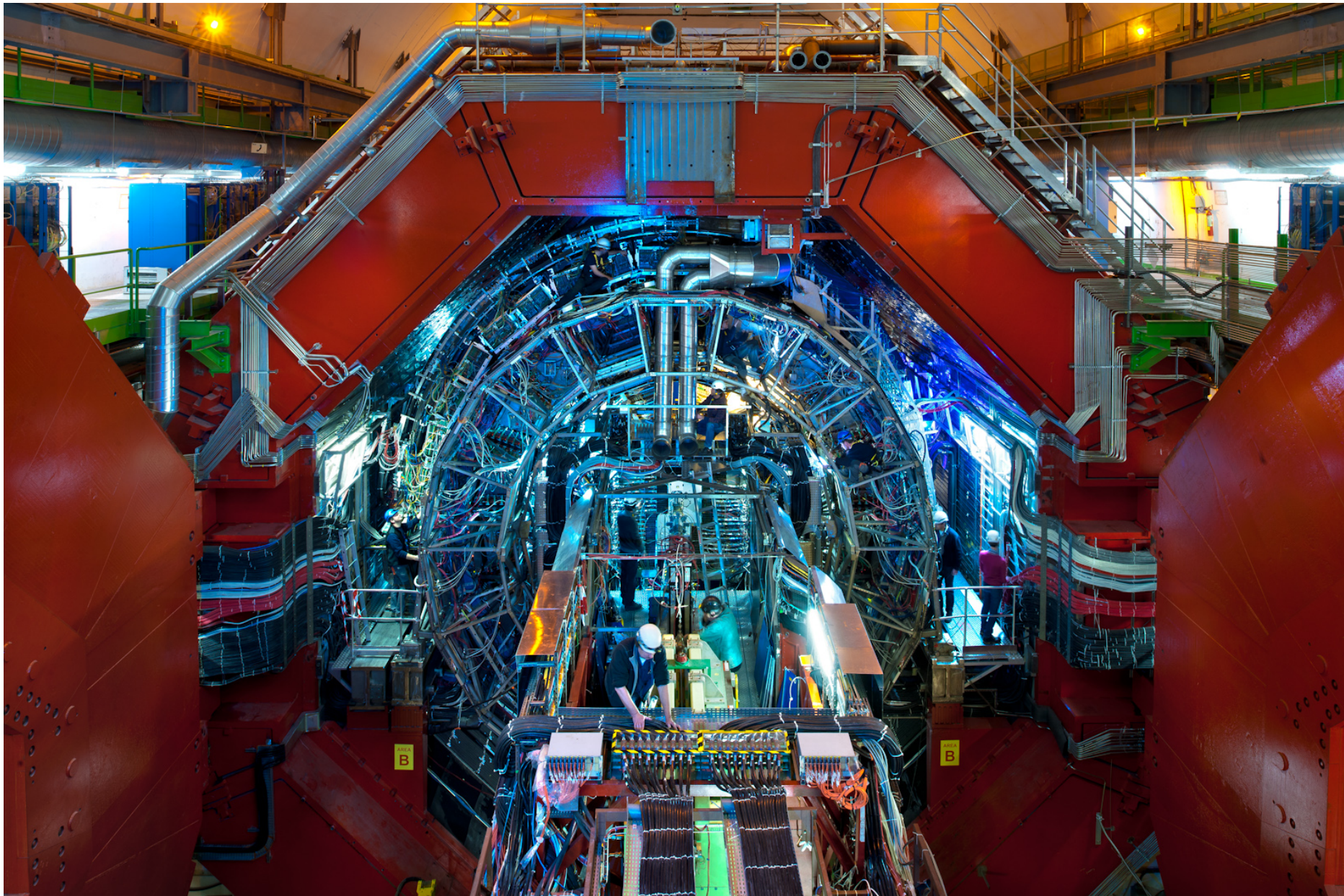




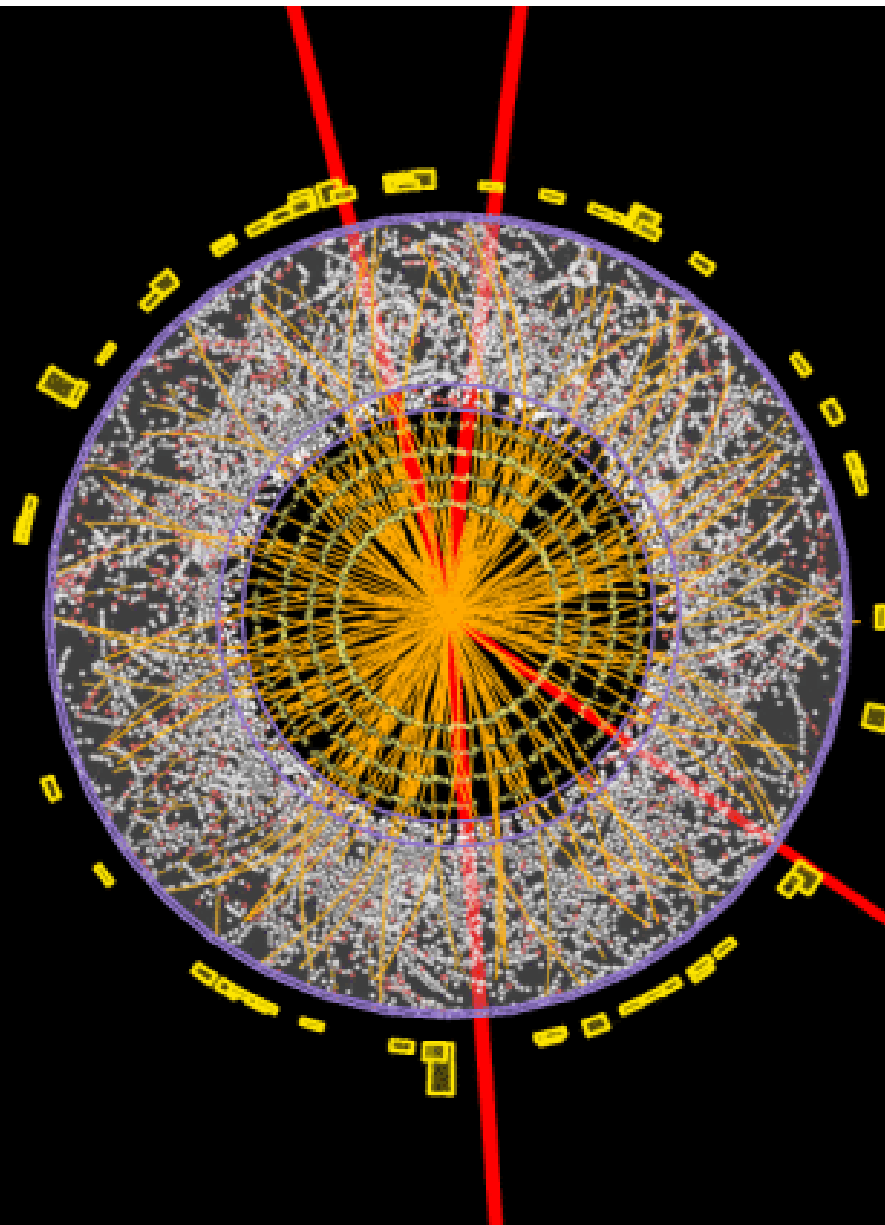










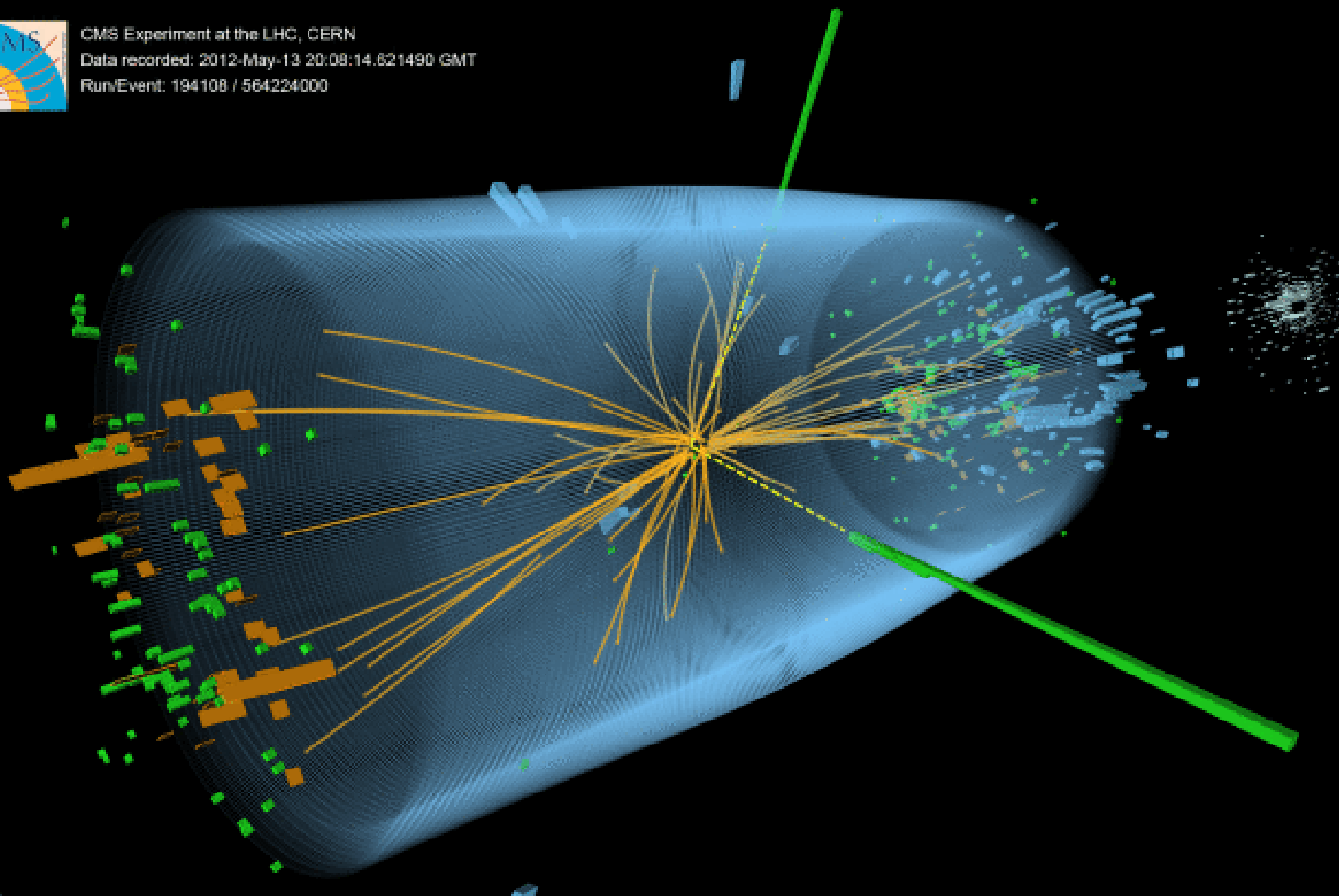




CMS Experiment at the LHC, CERN

Data recorded: 2012-May-13 20:08:14.621490 GMT

Run/Event: 194108 / 564224000




Today's trivia answer

$$10^{100} \text{ Collisions} * 10^{-12} \text{ Higgs/Collision} \\ = 10^{88} \text{ Higgs}$$

Extra:

$$10^{88} \text{ Higgs} * 10^2 \text{ GeV/Higgs} \\ * 10^{-24} \text{ g/GeV} * 10^{-6} \text{ tonnes/g} \\ = 10^{60} \text{ tonnes}$$

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CERN Accelerating science


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LHC@home

LHC@home is a platform for volunteers to help physicists develop and exploit particle accelerators like CERN's [Large Hadron Collider](#), and to compare theory with experiment in the search for new fundamental particles.

By contributing spare processing capacity on their home and laptop computers, volunteers may run simulations of beam dynamics and particle collisions in the [LHC's giant detectors](#).



The Sixtrack project


Help us to study the LHC machine and its upgrade to understand the fundamental laws of the universe.

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The Test4Theory project

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[View details »](#)



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Participants

Fabiola Gianotti, ATLAS Experiment

Joe Incandela, CMS Experiment

Shiri Dori-Hacohen, Google Student Ambassador

Ahmed Shamy, Google Student Ambassador

Prof.Dr. Sami M. AL-Jaber and students, An-Najah National
University, Palestine

Sofoklis Sotiriou and students, Ellinogermaniki Agogi, Greece

Credits

Gavin Ovsak — Google Science Fair host

Steven Goldfarb — Hangout with CERN fan

Heidi Kleinmaus & Gary Bolles – GSF Production

Kate Kahle & Achintya Rao — CERN Production

Thank you for watching!



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