



#askCERN

Hangout with CERN: Multiplying dimensions TEDxCERN preview

2 May 2013





Today's trivia question

- From where can you watch the TEDxCERN webcast on Friday 3 May?



LHCb

ATLAS

CERN Meyrin

CERN Prévessin

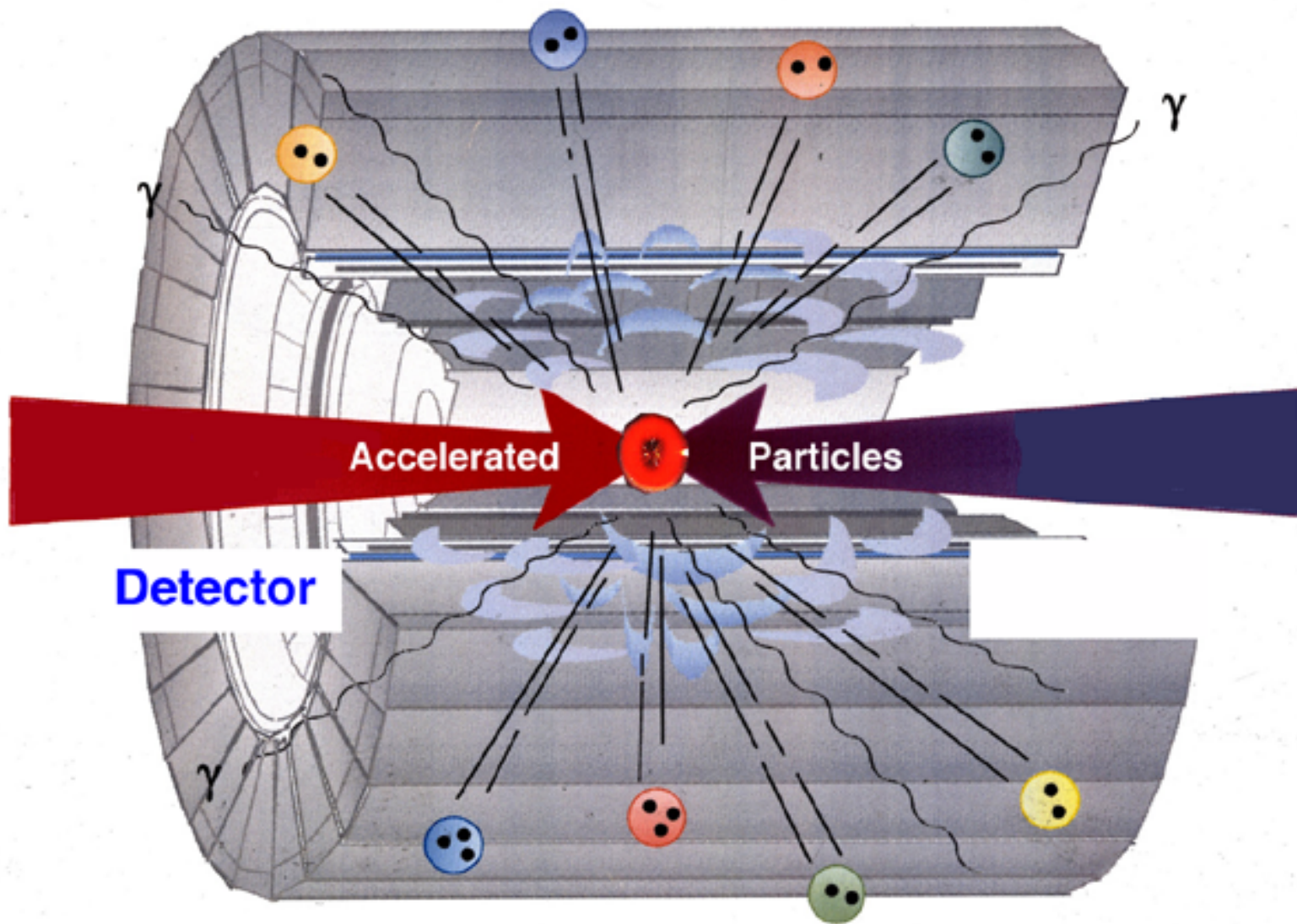
SPS 7 km

SUISSE
FRANCE

CMS

ALICE

LHC 27 km





TED^x CERN

x = independently organized TED event

TEDxCERN - Multiplying Dimensions



Session 1

- *The Universe: A Detective Story*
- Hiranya Peiris, Cosmologist

- *Networking Chemistry*
- Lee Cronin, Chemist

- *How to Discover a Planet from Your Sofa*
- Chris Lintott, Astronomer

- *Seafloor Earthquakes*
- Maya Tolstoy, Marine Geophysicist

- *Why All Good, and Some Bad, Research Is Improbable*
- Marc Abrahams, Editor

Session 2

- *DNA*
- George Church, Geneticist

- *Gendered Innovations*
- Londa Schiebinger, Historian of Science

- *Science as Voyage*
- Ian Foster, Computer Scientist

- *How to make a Neural Network in your Bedroom*
- Brittany Wenger, Scientist

- *Reach for the Stars (Mars edition)*
- Collège International de Ferney-Voltaire Choir

Session 3

- *Consciousness & the Brain*
- John Searle, Philosopher

- *SESAME: A Scientific Source of Light in the Middle East*
- Eliezer Rabinovici, Physicist & Zehra Sayers, Biophysicist

- *What the Higgs Might Mean for the Fate of the Universe*
- Gian Giudice, Theoretical Physicist

- *You're Never Too Young To Be a Research Scientist*
- Becky Parker, Teacher

- *Particles in Peace*
- Yaron Herman, Piano & Bijan Chemirani, Percussion

Today's trivia answer

Q. From where can you watch the TEDxCERN webcast on Friday 3 May?


A. Watch the webcast via <http://tedxcern.ch> or <http://webcast.cern.ch/> on Friday 3 May from 13h45 CEST

Send @TEDxCERN your questions

- CERN physicist Tara Shears will be interviewing Chris Lintott @TEDxCERN
- Send your #TEDxCERN questions to @TEDxCERN for Chris
- *Chris runs the Zooniverse, the world's most successful collection of citizen science projects, and is co-presenter of the BBC's long-running 'Sky at Night'.*

cern.ch/LHCathome


CERN Accelerating science [Home](#) [Learn more!](#) [Sixtrack](#) [Test4Theory](#)



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.

[View details >](#)

The Test4Theory project
Help us on the research about the elusive Higgs particle with our virtual atom smasher.

[View details >](#)



Do you want to help?
You can! Become a volunteer scientist donating some CPU cycles.

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Thoughts on work and life from particle physicists from around the world. Home

◀ [Impact majeur pour une toute petite mesure](#) [Mixing it up](#) ▶
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Huge impact from a tiny decay

The [Hadron Collider Physics Symposium](#) opened on November 12 in Kyoto on a grand note. For the first time, the [LHCb](#) collaboration operating at the [Large Hadron Collider](#) (LHC) at [CERN](#) showed evidence for an extremely rare type of events, namely the decay of a B_s meson into a pair of muons (a particle very similar to the electron but 200 times heavier). A meson is a composite class of particles formed from a quark and an antiquark. The B_s meson is made of a bottom [quark](#) b and a strange quark s . This particle is very unstable and decays in about a picosecond (a millionth of a millionth of a second) into lighter particles.

Decays into two muons are predicted by the theory, the [Standard Model of particle physics](#), that states it should occur only about 3 times in a billionth of decays. In scientific notation, we write $(3.54 \pm 0.30) \times 10^{-9}$ where the value of 0.30 represents the error margin on this theoretical calculation. Now, the LHCb collaboration proudly announced that they observed it at a rate of $(3.2^{+1.5}_{-1.2}) \times 10^{-9}$, a value very close to the theoretically predicted value, at least within the experimental error.

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Thoughts on work and life from particle physicists from around the world. Home

◀ [Mixing it up](#) [Le mystère plane toujours sur le boson de Higgs](#) ▶
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The mystery remains on the Higgs boson

Ever since the discovery of what might be the [Higgs boson last July](#), physicists from the [CMS](#) and [ATLAS](#) experiments have been trying to pinpoint its true identity. Is this the Higgs boson expected by the [Standard Model of particle physics](#) or some "Higgs-like boson" befitting a different theoretical model?

To tell the difference, we must check all its properties, like how often this boson decays into different types of particles, and determine its spin and parity, two properties of fundamental particles.

Since the new boson has a short lifetime, it breaks apart immediately after being created. There are five ways a Standard Model Higgs boson should decay that we can study at the [Large Hadron Collider](#) (LHC): breaking into two photons, two W or two Z bosons, two b quarks or two tau leptons in well defined proportions. We must check both the presence of and the rate at which each decay mode occurs.

Last summer, just after the discovery of the new boson, both experiments reported unambiguous observations in only three channels. Unfortunately, the data sample was still too small to really be able to check if the new boson could decay into a pair of b quarks or tau leptons.

With more data available, the two experiments have just shown results for all channels today at a [conference](#) held in Kyoto as shown on the two figures below.

Next Hangout with CERN in 2 weeks!

- Thursday 16 May, same time 17:00 CEST
- **Dimensions multiplied**, with special guests from TED-ED



TED^x CERN
x = independently organized TED event

Credits

Many thanks to all the TEDxCERN contributors, plus

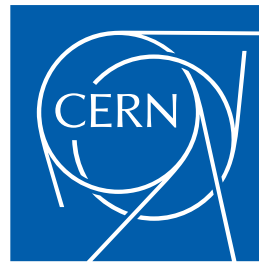
Steven Goldfarb — Host

Sara Wyke — Globe co-host

Achintya Rao — Q&A from Social Media

Achintya Rao — Production

Thank you for watching!



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