

*De Bron and Institutio Lucio*

# CERN AND LHC

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## INTRODUCTION

CERN or the European Organization for Nuclear Research is the largest research laboratory in Europe. Its main site is located in Swiss. it was founded in 1954 after the second world war. The main goal of CERN is to find out how the universe works. They attempt to do that with the Large Hadron Collider of the LHC. CERN's main function is to provide particle accelerators and other infrastructures for high-energy physics research. The main site has a lot of computing facilities which is used to store and analyse a lot of data, which is primarily used to store and analyse data from experiments.

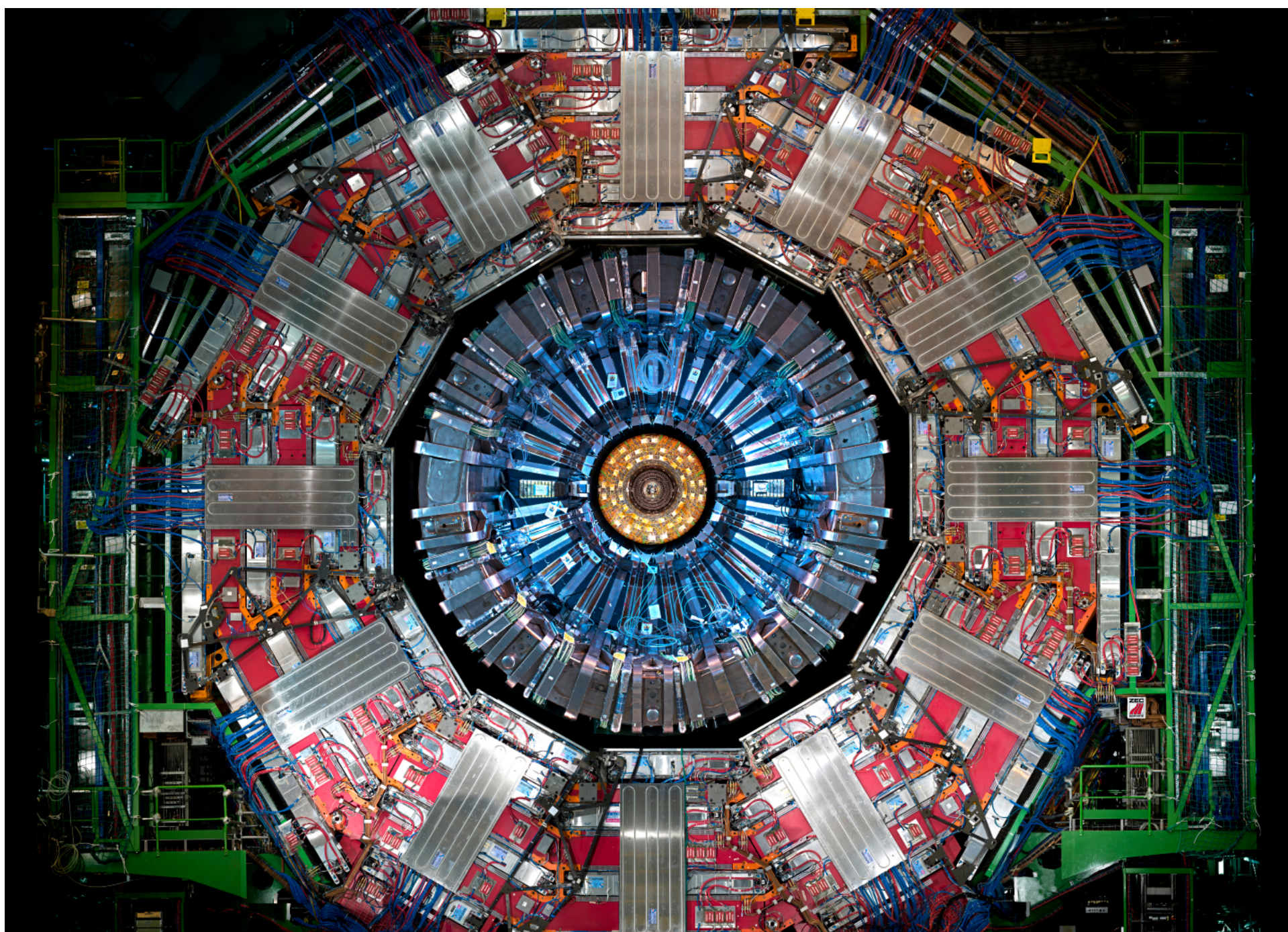


figure 1: <https://www.fastweb.it/web-e-digital/cern-di-ginevra-online-i-dati-dell-acceleratore-di-particelle/>

## HIGGS BOSON PARTICLE

The Higgs boson is the quantum particle associated with the Higgs field. Since the field cannot be observed directly, experiments have searched for the Higgs boson at CERN began in earnest in the late 1980s,

searched for the particle. The big difficulty initially was that theory did not predict the mass of the particle and it was possible that it could be found anywhere in a wide range of mass.

Finding the Higgs boson is not the end of the story; the physicists have to study this particle in detail to measure its properties.

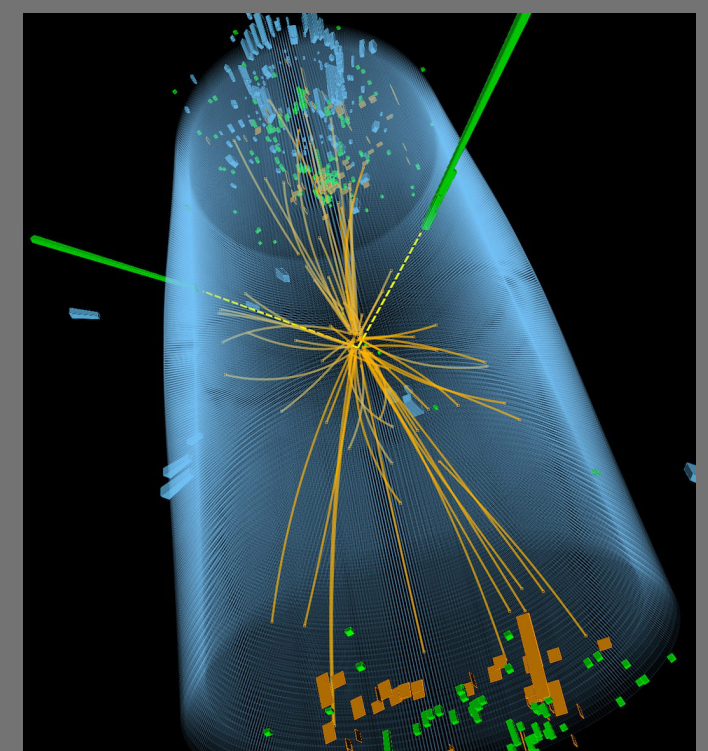
Furthermore, many questions remain unanswered. For instance, what is the

nature of dark matter, which makes up a large part of the Universe? Why

is there far more matter than antimatter in the Universe, when both

have been created in equal quantities at the beginning of the Universe?

And many other questions...



<http://www.quantumday.com/2013/01/2012-is-year-of-cern-highlights.html>



# LHC

LHC is very important for CERN. The Large Hadron Collider is the world's largest and most powerful particle accelerator. It consists of a 27-kilometre ring of superconducting magnets with a number of accelerating structures to boost the energy of the particles along the way. Its main purpose is to discover the substance and energy of the universe.



figure 3: <https://th.bing.com/th/id/OIP.WPPJ02DtejTlIx2bhUdTdwHaGQ?pid=ImgDet&rs=1>

# GREAT DISCOVERIES

At cern they are already investigating for over 60 years. In those years they made a lot of discoveries such as: the god particle, weak neutral currents, the w and z bosons, light neutrino's, antimatter, charge parity violation and the World Wide Web.

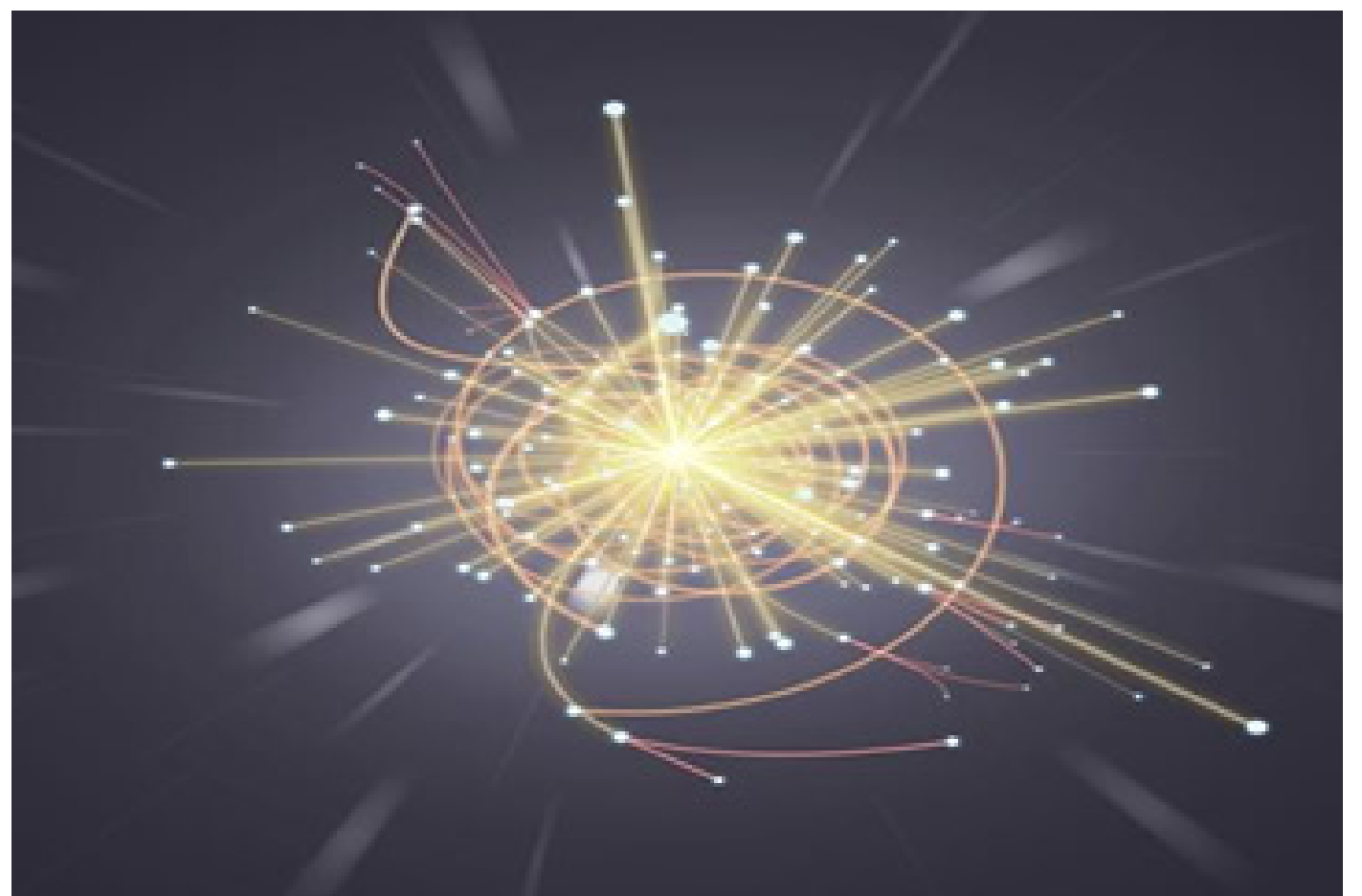


figure 4 lightneutrino <https://namaskar.cl/wp-content/uploads/2018/04/Quarks.jpg>

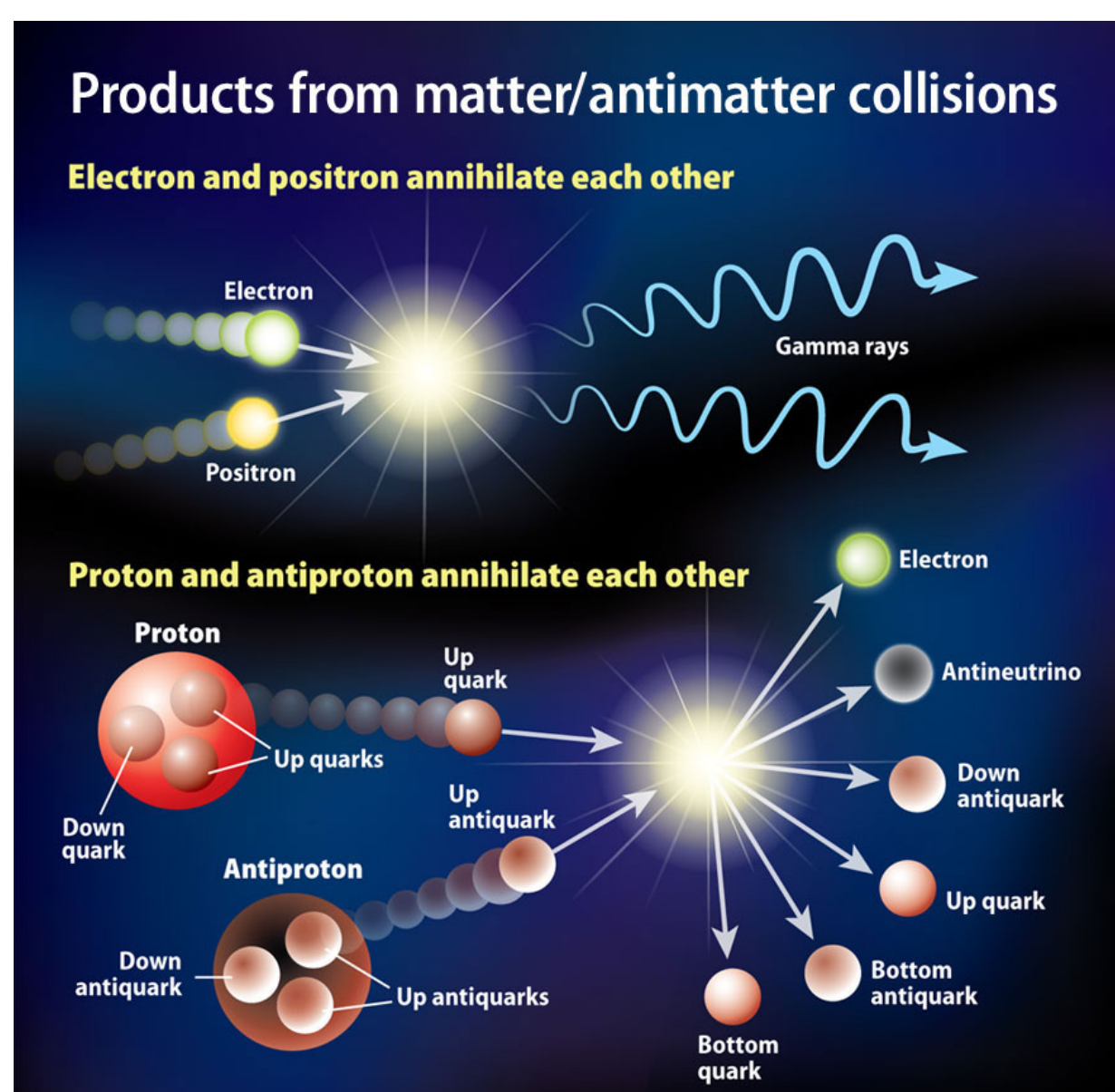


figure 5: matter <https://i.stack.imgur.com/Mn2R0.jpg>

# CERN'S FINAL MISSION

After all, we have three main goals. The first one is to provide a unique range of particle accelerator facilities that enable research at the forefront of human knowledge. Second of all, we want to perform world-class research in fundamental physics. And last but not least, our goals is to unite people from all over the world to push the frontiers of science and technology, for the benefit of all.