



Accelerating Science

We are all 14 000 000 000 years old!

An exciting voyage to the origin of the Universe and to the heart of matter.

The goal of the exhibition is to inspire a sense of wonder and curiosity about the origin of the Universe and the basic constituents of matter. It shows how experiments at the Large Hadron Collider at CERN will unravel some of the mysteries of the Universe, and it displays the connection between fundamental research in the past with technologies of the present.

The exhibition consists of the

- entrance tunnel, taking the visitor back to the time of the Big Bang;
- Big Bang theatre, narrating the history of the Universe;
- particle zone, displaying the basic structure of matter;

- mystery room, talking about the mysteries of matter and the Universe;
- CERN research area, showing how research at the LHC is done;
- display 'our world is built on basic research', linking basic research to our daily life.

Five short tunnel sections ('transfer pods') join together the five main zones, transporting the visitors from one theme to the next. The exterior walls feature decorative imagery, the exhibition branding and the exhibition title. The panel texts are written in the host country's primary language and in English. A significant part of the exhibition consists of interactive media (touch panels and games) that are particularly attractive to a younger audience. The level of the exhibition is suitable for visitors from age 12 and older.





if suspended in space. An audiovisual show of 5 min duration is projected on to this area, narrating the evolution of the Universe from the first instants of the Big Bang to the present day, in a visually and emotionally exciting way. The wall surface traces this story in more detail, using graphics and text.

Entrance tunnel

"You, the people you love and everything around you are made from particles that originated at the very beginning of the Universe."

This extraordinary concept brings together scientific fact and personal experience in a very powerful way. The visitors enter a darkened tunnel, lined with profound questions and key dates in the evolution of the Universe, bringing them back to the first instant of everything.

Big Bang Theatre

"The first stars are like factories, up to 1,000 times heavier than our sun. When their fuel is exhausted, they collapse and explode into giant supernovae, producing heavy elements - the building blocks of life."

The Big Bang theatre features a central floor projection area. The visitors lean over a safety rail to peer into a 'void', as

Particle Zone

"At CERN we investigate these tiny building blocks, the fundamental particles that make up your world and the entire Universe"

This zone explores the world of particles, guided by questions like 'How big are particles?' or 'What are particles?'. A flash animation transports visitors seamlessly from human scales into the microscopic world of atoms, nuclei and particles. An entertaining video animation shows how particles interact by exchanging messenger particles. Three interactive games invite visitors to discover the relationship between energy and mass by accelerating and colliding particles.

Big graphics panels on the walls complement these displays by showing the building blocks of matter and the messenger particles transmitting the four forces. A 'facebook'-like interactive display on a touch screen let visitors get acquainted with particles, the story of their discovery, and some of their properties.



Mystery Room

"All visible matter accounts for just 4% of the Universe. So where's the rest of it?"

This area is dedicated to some of the most intriguing mysteries of the Universe. The wall graphics, showing a small human figure surrounded by a large dark area, represents the fact that we only understand 4% of the composition of the Universe. Formulas scribbled across the walls symbolize attempts to solve these mysteries. Some of the big questions on the walls are explored in greater depth by using the interactive panels to hear the account of scientists talking about the mysteries that interest them most and about their ideas to answer them.

CERN research

"When two beams of protons collide inside the Large Hadron Collider they generate temperatures 1,000 million times hotter than the heart of the sun but in a minuscule space."

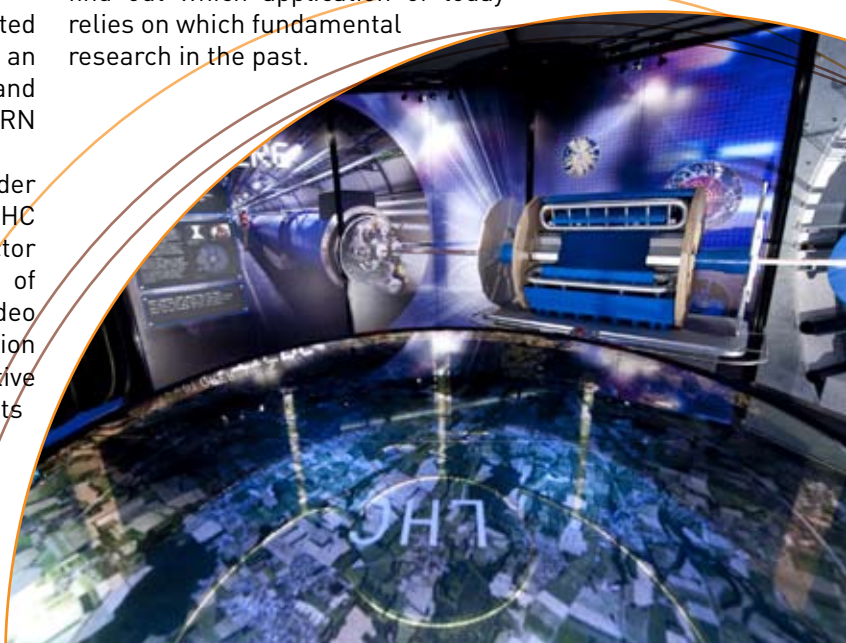
This zone is dedicated to the research at CERN. Located in the centre of the area is a large screen featuring an aerial view of the country side above the LHC tunnel and an animation showing the path of particles in the CERN accelerators.

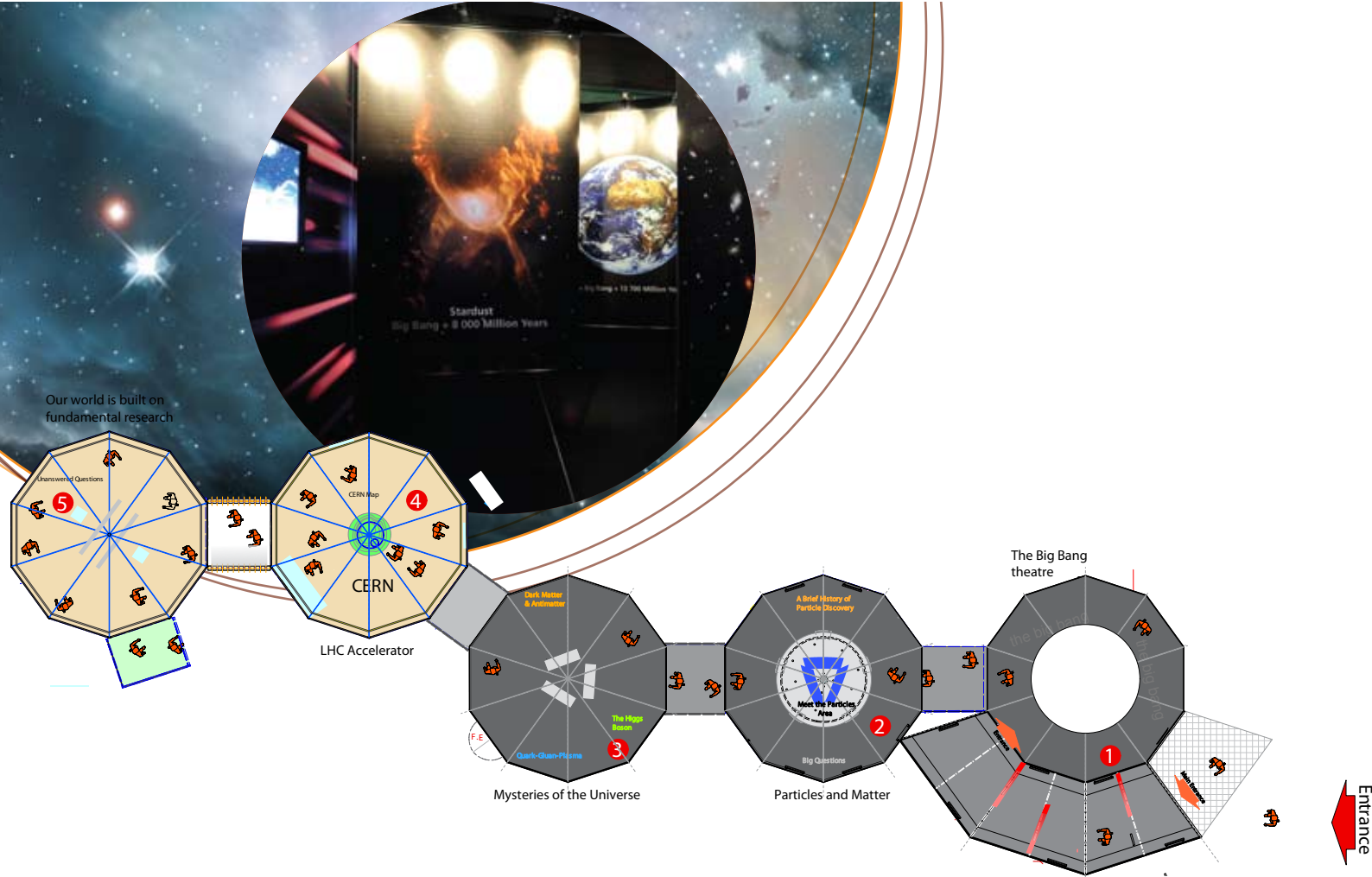
Next to it stands a model of the Large Hadron Collider (LHC), featuring a real-size mockup of part of an LHC magnet, together with a 1:25 model of the ATLAS detector that contains a large video screen displaying tracks of particles created in proton-proton collisions. A video screen shows a film with highlights from the installation of the LHC and the four detectors. Finally, an interactive screen offers the opportunity to find out fascinating facts about the technical superlatives realized in the LHC.

Our world is built on basic research

"Many of the challenges we face, whether it's curing diseases, growing food to feed the hungry, providing clean drinking water, preserving planet earth or discovering the origins of the Universe depend on science for the answers."

The last zone explains how fundamental research is linked to technological applications in our daily life. The central installation consists of two multitouch interactive systems that illustrate the wide range of technologies (TV, mobile phones, satellite transmission, medical diagnostics, GPS, WWW, Internet) that we are taking for granted nowadays. However, these technologies would have never been invented if it were not for a few scientists in the last centuries asking very fundamental questions about the nature of electricity, of the relation between space and time, or the functioning of an atom. By exploring different fields of technology (medicine, communication, electronics, energy) using the multitouch interface, the visitor can find out which application of today relies on which fundamental research in the past.





Our world is built on
fundamental research

Unanswered Questions

5

CERN Rap

4

CERN

LHC Accelerator

Dark Matter
& Antimatter

The Higgs
Boson

Quark-Gluon Plasma

3

Mysteries of the Universe

A Brief History of
Particle Discovery

Meet the Particles
Also

Big Questions

2

Particles and Matter

The Big Bang
theatre

1

Entrance

For more information,
please contact :

Rolf Landua
Head of Education
CERN / PH-EDU
European Organization
for Nuclear Research
Route de Meyrin
1211 Geneva 23
Switzerland
+41 22 767 20 51
Rolf.Landua@cern.ch

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Some key data:

- Minimum area required: 400 m².
- Minimum ceiling height: 3.50 m
- Minimum hall width required for stand installation: 9.00 m
- Preferably no columns or pillars within the exhibition area
- Floor loading: 500kg/m²
- Low level of ambient lighting
- Exhibition hall on ground floor, or necessity of large lift with access to exhibition area
- 380 V, 32 A, 3 phase electrical mains supply

Packaging

The exhibition material is transported in a set of customized flight cases and crates for protection and storage. All the cases are either on wheels or are easily transportable with a pallet trailer. The largest crate is 200 cm x 200 cm x 150 cm. Transportation needs: two lorries.

Storage

An area of approximately 100 m² is required for storing the exhibition packaging for the duration of the exhibition.

Configuration

The immersive style of the exhibition provides a consistent experience for visitors while fitting into any host venue that fulfils the above requirements. The modern exhibition system framework brings flexibility and ease of use. The five zones are decahedron (10-sided) shaped and can be configured in different ways to adapt to the geometry of the exhibition area.

Safety aspects

The exhibition respects the present International Safety and Security regulations that are practiced within the ECSITE network. There is an emergency fire exit in Pod 3. All electrical, audio and video devices are controlled through a central technical area, which can be locked and is only accessible to authorized staff.

This exhibiton has been developed in partnership with the University of Geneva, thanks to the generous support of the Dudley Wright Foundation for supporting the exhibition.