Visitor tour for CHATS on 13 October 2011 (Afternoon)

SM18 exhibition

SM18 is a hall dedicated to the cryogenic test of superconducting magnets and cavities built for the LHC. The test hall is divided into 4 main areas:

1. area of SC magnet test in vertical cryostats (for short bare magnets)
2. area for testing Sc magnets integrated in horizontal cryostat,
3. area of Sc RF cavity assembly and test[1] and
4. area dedicated to the supply of the coolant: the LHe cryogenics[2].

The area of magnet testing is an open visible space that is composed by 12 test benches. Each of them has a magnet support structure, the cryogenic feeding system. By groups of two benches, they are equipped with a power supply, a switch and control and data acquisition systems.

The horizontal test benches were extensively used during the construction phase of the LHC when the 1232 dipoles and about 400 quadruples have been tested individually, integrated in their cryostats with all features for operation in the machine. The 12 test benches allowed a test rate of up to 12 magnets/week, by operating the system 7 days a week and 10.5 months/year. These qualification tests at 1.9K of the magnets up to and above their design operating current, have been done within a large collaboration between INDIA and CERN during a period of 4 years.
Today the installations are fully operational and used with a lower rate of testing, adapted to our needs today. We test magnets repaired following the incident in sector 3-4 with the goal to reconstruct our spare stock of magnets for the LHC. In addition we use these installations for special tests in support of the LHC operation or for our R&D projects.

When visiting the SM18 hall, one can see the newly arranged area for vertical tests as well as the horizontal test benches with the LHC spare magnets under qualification at various stages (cool down, power test, etc.). The special remote controlled robotrucks that have been developed for the transport of the 30 tonnes – 15 m dipoles will also be in the exposition and in operation. Finally , an expo area showing the different components of the LHC magnets (dipoles, quadrupoles and correctors) as well as a cross section of a HTS (Bi-2223) current lead feeding some 3 MA into the LHC magnets.. Two full scale mock-ups: one of the LHC tunnel, with two long magnets installed and one of the magnets interconnections are exposed, too.

FOOT NOTES:

1. The area dedicated to the activities of the RF cavities is not accessible but few cavities are also exposed.
2. The cryogenic installations are partially visible.

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The Large Magnet Facility at CERN

The Large Magnet Facility at CERN has the capability to disassemble, repair and reconstruct all superconducting magnets in the LHC, and is one of the core assets of the superconducting magnet group. This is an impressive and unique show of technology and tooling, united in one of the largest workshops at CERN.

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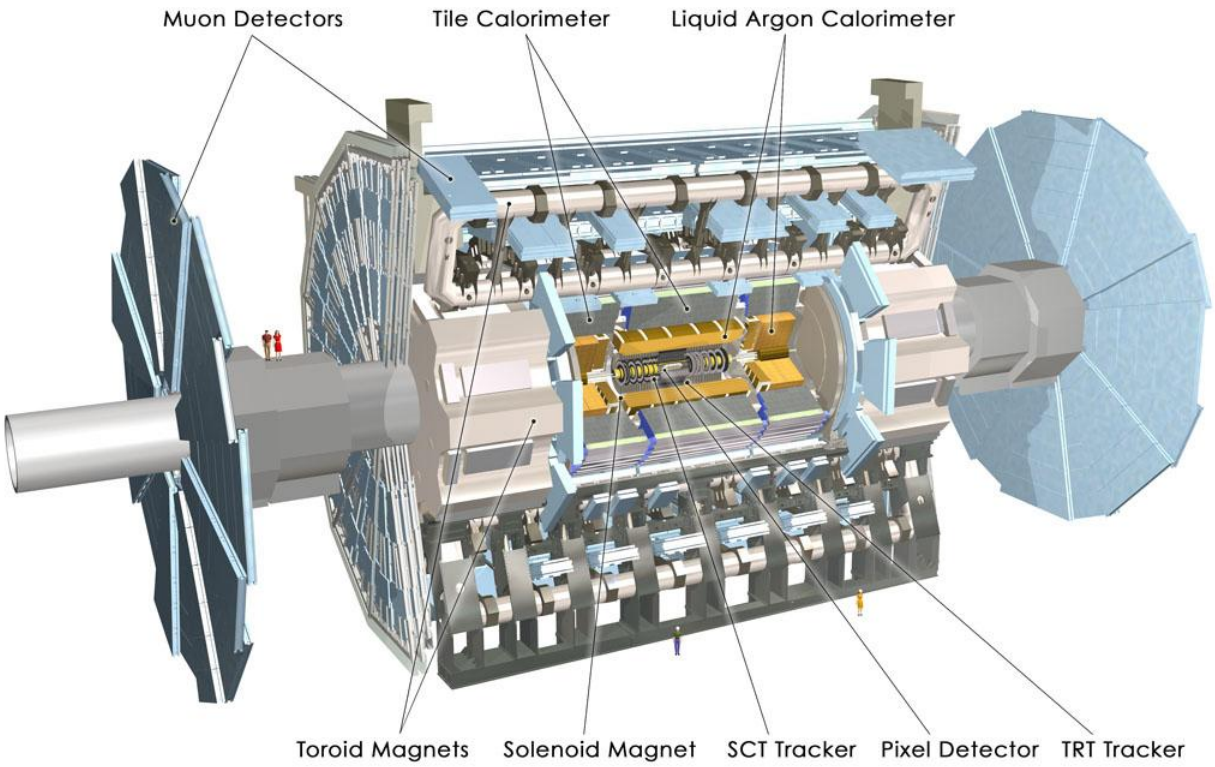
Visiting the ATLAS Experiment chasing the Higgs particle and much more...



The Large Hadron Collider provides proton-to-proton collisions in 4 experimental halls some 90 m underground. There are 2 general purpose discovery detectors called ATLAS and CMS and 2 smaller detectors, LHCb and ALICE dedicated to specific experiments. ATLAS is in size the largest experiment and housed in a 50,000 m^3 cavern just opposite CERN's main entrance and neighbour of the brown ball shaped exhibition and events centre the GLOBE.

Most of the particle detectors use a solenoid for particle bending surrounded by a massive iron yoke used to enhance, shape and capture the magnetic field. Not so in ATLAS, where in addition to a 2 T superconducting central solenoid there are also three huge superconducting toroids which are used for muon tracking and detection. From a magnet engineering point of view ATLAS is very innovative, complex and hybrid superconducting magnet system with record dimensions of 22 m in diameter and 25 m in length. So far the largest toroids ever built.

The tour will bring you 90 meters above the detector from where the ATLAS Experiment is controlled, data is captured and sent around the world. When approaching the site an immense colourful artist impression of the detector painted on a wall will please your eyes. On entering the audio-visual and control centre we immediately glimpse the operators working 24/7 to catch the best data the LHC can provide...
The everything-about ATLAS is explained and a 3D movie shows the making of ATLAS. The underground area is not accessible while the protons fly around, nevertheless, we hope you will be infected by our enthusiasm and spirit to find explanations about the why, when and where...

More information can be found here: http://atlas.ch/
ATLAS on YouTube: http://www.youtube.com/theATLASExperiment
Angels & Demons: http://www.atlas.ch/angels/

CCC: The CERN Control Center

The Cern Control Center, or CCC, is the Center of the pulsating heart of CERN. Particles generated and accelerated in the injector chain are timed with utter precision and sent to one of the many CERN experiments, or injected into the LHC. This is where the Large Hadron Collider is driven to its record energy and luminosity.