



Editorial

Revisiting Cern: The European Organization of Nuclear Research

High technology Cern, the European Organization of Nuclear Research lies in the shade of Mont Blanc. The visitors' centre has been renovated with interior and exterior face-liftings. The Cern can be visited by diverse group of tourists, having different level of knowledge of advanced physics. Now the visitors' centre invites the tourists in its new attire to be acquainted with the big research plant. It has since its foundation in the year 1954 with its fundamental knowledge of physics has changed the composition of the matter. But its scientists are never out of themes. They want to understand always further the basic strength of physics and with that lastly what the universe consists of and how the earth functions right upto the last into the elementary particle. Thousands of scientists from all over the world conduct research for that, irrespective of nationality and cultural background. Among them, there are several physics Nobel laureates like Georges Charpak, Jack Steinberger, Carlo Rubbia and Simon von der Meer.

Already in 1964, Scottish Peter W Higgs and the Belgian Francois Englert independent of each other brought about the theoretical consideration of the existence of a new particle, linked with the question how the elementary particle have a mass. After 48 years it gave the practical proof. The so-called Higgs-particle was discovered in summer 2012 in Cern with the help of worldwide strongest and costliest particle accelerator "Large Hadron Collider" (LHC).

In course of disintegration the researchers could establish the existence of Higgs particles alone through light beam with partially enormously sensible detectors.

In 2013, both the physicists were awarded the Nobel Prize by the Royal Swedish academy of Science in Stockholm. Staffan Normark at that time secretary of Nobel Prize Committee mentioned in his announcement of Nobel Prize winners however explicitly that the mechanism through experiments of the particle accelerator in Cern have been confirmed. The LHC is the turning and hinge point of the fundamental physics research in Cern. It runs underground through the regions of France and Switzerland. In a circular tunnel of about 27 km, individual hydrogen protons are dashed against in the stretch in smaller than ten thousandth of a second as it were with the speed of light, along 9300 magnets and 4 detectors. Exactly at these 4 locations the protons collide with each other with enormous kinetic energy thereby generating in best case new particles with new properties whose data are evaluated by highly complex computers before these are in fraction of a second again disintegrate. Because of the huge quantity of data, many are sent to researchers for analysis in the whole world.

That was not always so. In 1980s there was a communication problem in Cern. The distribution to two different countries with two differing network infrastructures made the exchange on information complicated to rather

impossibility. The solution of the problem was bestowed upon the world and finally, the worldwide web and the Cern a project that the communication of the research results between home institutions and universities has been simplified. The hyper text system which the British physicist and information scientist Berners-Lee has brought on the way to Cern is still today to be considered digitally.

Cern received 300000 queries per year

- The big research plant Cern can be visited, conducted tours in which the control centre, old accelerator, the magnet-test hall, the antimatter factory and other typical starting points can be shown but must be applied for that on time.
- Frequently there may be longer waiting time which as per expected schedule – sometimes can lasts for 4 to 6 months. Cern gets 300000 queries per year. 110000 interested visitors visit the widespread compound with its laboratories and control centres.
- One who likes to see the underground Super accelerator must wait however upto 2019. Then the visitors might be permitted again in the ring tunnel which lies at a depth of 100 m under the surface of the earth. Absolute precondition for that “During

this interval the work remains still at LHC and the radiation level for the tourists’ movement is correspondingly low”.

- For two continuing exhibitions one does not need any previous reservation “Universe of Particles” is the exhibition on the universe of particles. It is in the building brought under “Globe of Science and Innovation”. The exhibition ‘Microcosm’ is engaged with the riddles of universe and the technologies of Cern.
- In the visitors’ centre “Globe” the background of Cern is illuminated in which scientists reveal in English, French, Italian and German as to why it is the biggest mystery on earth. Out of the Audio-Chairs plunged in fully secrecy blue light from a film show – clarifies what the Cern at all makes.

Photograph of Cern is in the back inside cover

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