

The Large Hadron Collider (LHC) and the Higgs-boson

E. Klopfer, klopfer.ervin@t-online.hu

The CERN (European Organization for Nuclear Research) was founded by 12 countries, in 1951. Nowadays, the Large Hadron Collider (LHC) in CERN/Genève is the most powerful particle accelerator of the world. It was started on 10 September, 2008. LHC is a proton synchrotron, collides protons are running opposite directions in the main ring of 27 km circumference, up to energy of 7+7 TeV. We discuss the main physical and technical parameters of LHC, in this paper. Researches at the LHC are follows: origin of the mass of "elementary" particles, Higgs-boson, dark matter and dark energy, origin of matter-antimatter asymmetry in the present Universe, supersymmetry (SUSY), quark-gluon plasma, preons etc. We also discuss the Standard Model and some open problems in connection with it. Higgs-boson was predicted by Peter W. Higgs et al., and it was founded at the LHC in 2012 with a certainty of 4,9 sigma. Finally, Francois B. Englert and Peter W. Higgs have gained the Nobel Prize in Physics in 2013, for the discovery of Higgs-boson.