

Invitation à la soutenance publique de thèse

Pour l'obtention du grade de Docteur en Sciences

Monsieur Gauthier DURIEUX
Master en sciences physiques, à finalité approfondie
Baryon number violation at the TeV scale

The astonishing stability of ordinary matter is a mysterious fact established experimentally far beyond common wisdom. A conservation of "baryon number" would actually make absolutely stable the protons of atomic nuclei. This is, however, a doubtful theoretical hypothesis. Violations are indeed required to explain the apparent matter-antimatter asymmetry in the universe and occur "non-perturbatively" in our standard description of fundamental interactions.

The present dissertation investigates the forms a violation of baryon number could take at energy scales a thousand times larger than the proton mass. By accelerating particles against each other at such "TeV" energies, the LHC is currently exploring the frontiers of our understanding of elementary particle physics.

An effective description of baryon-number-violating interactions is first adopted. It is built upon the same ingredients (fields, Lorentz and gauge symmetries) as our standard model and is therefore particularly general. In addition, transposing the standard-model pattern of global "flavour" symmetry breaking to baryon-number-violating interactions can simultaneously render them elusive at the proton mass scale and observable at the TeV scale. Their possible manifestations at the LHC are studied, generically and in a specific "supersymmetric" framework.

Vendredi 10 octobre 2014 à 15h00

Auditoire CYCL01
Chemin du Cyclotron, 2
1348 Louvain-la-Neuve



Membres du jury :

Professeur Fabio MALTONI (UCL) (*Promoteur*)
Professeur Jean-Marc GERARD (UCL) (*Président*)
Professeur Giacomo BRUNO (UCL) (*Secrétaire*)
Professeur Christophe GROJEAN (ICREA, IFAE, Barcelone)
Professeur Jernej KAMENIK (Jozef Stefan Institute, Ljubljana)