

**Irfu**Institut de recherche  
sur les lois fondamentales  
de l'Univers**Séminaire  
SPP****Lundi 16/09/2013, 11h00**

CEA-Saclay Bat 141, salle André Berthelot

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# Overview of the Higgs boson studies at the Tevatron

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The Standard Model describes the unification of electromagnetic and weak interactions. It has been thoroughly tested over the past forty years, and represents one of the major successes of modern physics. This theory predicts the existence and the masses of the weak bosons and the existence of a Higgs boson which is crucial for our understanding of the origin of elementary particle masses. In July 2012, LHC experiments reported an observation of the new particle in the search for the Higgs boson with a mass of 125 GeV decaying to predominantly to  $\gamma\gamma$  and  $ZZ$ , while the Tevatron experiments provided evidence for the decay in  $b\bar{b}$  pair of a particle compatible with the boson discovered at Cern. To confirm that the discovered boson is a Higgs boson, it is necessary to establish the production and decay rates in the different modes, and its spin and parity properties. I will present an overview of the searches in all final states, with emphasis on the  $H \rightarrow b\bar{b}$ , and combined results from the D0 experiment. In addition, I will review all Higgs boson Tevatron results with emphasis on coupling, and spin and parity determination.

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Le café sera servi 10 minutes avant.

NB : La présentation d'une pièce d'identité est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance Martine Oger, tél. 01 69 08 23 50, e-mail : [martine.oger@cea.fr](mailto:martine.oger@cea.fr). (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).