



# Cours de physique théorique

agrée par l'École doctorale "Physique en Ile de France"

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*Higgs physics in the Standard Model and beyond*      *Brando Bellazzini*  
IPhT

*Les vendredis 13/6/2014, 20/6, 27/6, 4/7 à 10h00.*

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I will recall the lagrangian of the Standard Model (SM), discuss the problem of the origin of mass for elementary particles, and present the electroweak symmetry breaking mechanism and the Higgs boson. I will discuss the basics of effective field theories, explain how to work with non-linearly realised symmetries, and comment on the hierarchy problem of the SM.

I will review the main features of the Higgs boson, its phenomenology at LHC, the custodial symmetry, the Higgs low-energy theorems, and the equivalence theorem. I will present universal sum rules for the Higgs boson coupling to electroweak gauge bosons. I will comment on the Higgs potential at very high energy and the associated vacuum (in)stability. Finally, I will briefly present the main ideas of composite Higgs models.

Only a basic knowledge of QFT is required.

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**Lieu :** IPhT, CEA Saclay, Orme des Merisiers, Bât. 774, p. 1A Salle C. Itzykson.

**Accès :** navettes CEA du RER B Le Guichet vers CEA Ormes, toutes les 15 minutes de 8h00 à 9h45  
ou bus publics Mobicaps 9 et 10, Albatrans 91.06 et 91.10.

**Renseignements :** <http://ipht.cea.fr> ou [ipht-lectures@cea.fr](mailto:ipht-lectures@cea.fr)

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