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Particle Physics at LPTHE

Mardi 5 Mars 2024, 14 :00
LPTHE, Library and Zoom (link in the comments)
Domaines : hep-ph

Titre : *Cornering New Physics with precision calculations of Higgs-boson properties*

Orateur : **Johannes Braathen (DESY)**

Résumé : *Thanks to the Higgs boson's close connection with many unsolved problems of Particle Physics, precision studies of Higgs properties constitute a crucial probe of Beyond-the-Standard Model (BSM) Physics. Among these properties, the trilinear Higgs coupling provides a unique opportunity to access the structure of the Higgs sector, investigate the nature of the electroweak phase transition and the origin of the baryon asymmetry of the Universe, and search for indirect signs of BSM Physics. I will show that the trilinear Higgs coupling can, in models with extended scalar sectors, be significantly enhanced with respect to its SM prediction. Consequently, the current experimental bounds on this coupling are already sufficient to rule out significant parts of the BSM parameter space that would otherwise be unconstrained by state-of-the-art theoretical and experimental constraints. Next, I will present the new public tool anyH3, which provides complete one-loop predictions for the trilinear Higgs coupling in arbitrary renormalisable theories. I will review the main features of anyH3 and present examples of new results obtained with it, as well as ongoing developments.*