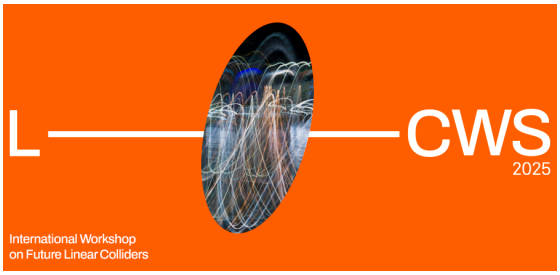

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Sensitivity to New Physics in the trilinear Higgs coupling

Wednesday 22 October 2025 09:40 (15 minutes)

The trilinear Higgs coupling offers a unique opportunity to probe the structure of the Higgs sector and study the nature of the electroweak phase transition. It constitutes a "holy grail"for Particle Physics and is a crucial target for future experiments.
Recently, it was also shown that confronting the prediction for the trilinear Higgs coupling with the latest experimental bounds opens a powerful new way to probe possible effects of Beyond-the-Standard-Model (BSM) Physics arising from extended Higgs sectors, going beyond existing experimental and theoretical constraints. Meanwhile, significant progress has also been made in the calculation of the trilinear coupling in BSM models and the automation of such calculations.

In this talk, I will present several examples of realistic BSM scenarios in which large deviations occur in the trilinear Higgs coupling, while other Higgs properties (e.g. its decay width to two photons or the $e^+e^- \to Zh$ cross-section) would not exhibit sufficiently large effects to be detected with precision measurements. I will demonstrate that concerns often raised against such scenarios – like their behaviour under renormalisation-group running, their matching to EFTs like SMEFT, etc. – can in many cases be addressed or verified, so that very interesting scenarios survive.
These examples provide strong motivation for a *direct measurement* of the trilinear Higgs coupling at the next Higgs factory.

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