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Indications for new physics at the LHC

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The Standard Model (SM) of particle physics provides a very good description of nearly all available experimental data. Notable exceptions are Dark Matter (DM) and the Baryon asymmetry of the universe (BAU, the question why we only see matter, but not antimatter). These questions point towards physics beyond the SM (BSM). While DM points towards some new so far undiscovered symmetry, the BAU leads to models with extended Higgs sectors.

The Large Hadron Collider (LHC) at CERN is searching for BSM physics. However, no clear signal of BSM physics was discovered so far. While the need for BSM is firmly established, the LHC data nevertheless exhibits some interesting anomalies that could point towards BSM theories with new symmetries and/or extended Higgs sectors. I will review the status of the BSM searches at the LHC and discuss some promising excesses in the data. I will demonstrate how this kind of excesses can be analysed with future (High Luminosity-) LHC data, or at a future e^+e^- collider. The confirmation of any of the many excesses and anomalies in the LHC data would pave the way for future experimental and theoretical explorations.

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None

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