PARTICLE PHYSICS: STANDARD MODEL AND BEYOND

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In this Colloquium talk I will present an overview of the Standard Model of particle physics, that describes the microscopic world of fundamental particles. The focus will be on the symmetry structure of the model and the Higgs mechanism. The complexity of a high energy collision in a hadronic collider, such as LHC, will be qualitatively addressed, and the main ingredients needed for a cross section calculation will be briefly introduced. Over the years, the Standard Model has proven to be a solid model providing predictions of experimental measurements with astonishing accuracy. Despite that, physicists have well-founded reasons to search for new physics. To conclude, I will review these reasons and give examples of possible extensions of the Standard Model.