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Recent results on searches for physics beyond the Standard Model at the LHC and future outlook

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The Higgs boson discovery by the CMS and ATLAS experiments at CERN was a major milestone for particle physics and marked another success of the standard model, our current best theory for elementary particles. In this talk, I will discuss the implications of the Higgs discovery and our endeavor to shed light on the nature of the dark matter and gauge hierarchy problem through searches for supersymmetry using the data collected with the CMS detector at the Large Hadron Collider (LHC). A novel experimental technique has been developed for these searches. I will also discuss our effort to upgrade the CMS detector systems for future data taking and physics potentials with the upgraded detector.