

SUSY: Model-Building and Phenomenology

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The workshop “SUSY: Model-Building and Phenomenology” was successfully conducted at the Kavli IPMU during December 2 - 4, 2013. Having a workshop dedicated to current situations and future prospects of supersymmetry (SUSY) model-buildings and their phenomenological studies was the most important and timely idea because of the following reasons. First, the recent discovery of a new boson and subsequent measurements of its properties at the CERN Large Hadron Collider experiment (LHC) indicates that the boson seems strongly to be the Higgs boson predicted by the standard model (SM). Next, no new physics signals, on the other hand, have been discovered at LHC, which provide very stringent constraints on SUSY models. Finally, no robust new physics signals have been detected at dark

matter detection and flavor-related experiments, either. Because of the reasons, many SUSY models proposed before LHC were ruled out and people were required to build new SUSY models which are consistent with the new experimental results with taking care of the naturalness problem concerning the electroweak scale.

All of these issues were covered in great depth in the workshop, which included twelve plenary talks and seven contributed (short) talks. The workshop was launched by an opening talk by Kavli IPMU Director Hitoshi Murayama, where he gave a broad overview of the physics concerning new physics (SUSY) models. This was followed up with subsequent thorough talks by Graham Ross on several known SUSY models with focusing carefully on

the fine-tuning problem, by Norimi Yokozaki on the focus-point scenario, by Philipp Kant on three-loop Higgs mass calculation in MSSM, by Joshua Ruderman on high-scale SUSY model, by Tomer Volansky on R-parity violating scenario, by Fuminobu Takahashi on SUSY cosmology, and by Masahiro Ibe on the pure gravity mediation model. There were also two experimental (ATLAS) talks by Shimpei Yamamoto and Naoko Kanaya discussing the current status and future prospects on SUSY searches at LHC. In addition, attractive non-SUSY scenarios were presented by Pyungwon Ko and Mikhail Shaposhnikov. Through the talks, participants could clearly understand the situation of SUSY (and non-SUSY) model-buildings and obtain a clue of promising future directions on this subject.

This workshop was originally planned to be a small one, but the number of participants was actually much more than we expected. This fact means that the topic of the workshop is now regarded as the most important one by almost all researchers in particle phenomenology, and having a similar workshop at the Kavli IPMU in the near future will be very important.

