

The Kavli IPMU School on The Future of Collider Physics

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The Kavli IPMU School on the Future of Collider Physics was successfully conducted during July 16-19, 2013. Having a school dedicated to the future prospects of collider physics was a very timely idea for three main reasons: the recent discovery of a Higgs-like boson at the CERN Large Hadron Collider (LHC) and the subsequent measurement of some of its properties in the early LHC run, the promise of gathering a wealth of new information on the Higgs in the next runs of the upgraded LHC, and finally, the prospects of having an International Linear Collider (ILC) in the near future as a Higgs factory and a precision machine. All of the three broad areas were covered at great depth in the school, which included 12 lectures by leading experts in the field, one poster presentation session by the participants and a panel discussion session on the big questions and promising directions in this subject.

It was no surprise that most of the lecturers focused on different aspects of Higgs physics, with topics ranging from an effective field theory framework



to parametrize the deviations of Higgs properties from the Standard Model and the current status of its measurements, to important concepts in statistics necessary to properly interpret the data presented by the ATLAS and CMS collaborations. The current status of theoretical calculation of Higgs cross-sections, the next-to-leading order event generators and future goals in improving the higher order QCD calculations and parton distribution functions were also reviewed. New techniques in top quark physics were discussed as well, which might prove to be crucial in new physics search at the LHC.

The school was kick-started by an opening lecture

by Kavli IPMU Director Hitoshi Murayama, where he gave a broad overview of the physics behind a high-precision machine like the proposed ILC with its associated challenges, and the accuracy with which it can determine the properties of new particles at the weak scale including the Higgs boson. Hitoshi also informed us about the current status of Japan hosting the ILC in the near future. This was followed up in the subsequent days with very thorough talks

by experimentalists on the high-luminosity LHC programme and details on the ILC accelerator and detector developments and physics goals.

The participants included around 45 graduate students and postdocs from all over Asia, most of them being from Japan, India, South Korea, Taiwan and China. They also presented their recent work in a poster session, during which very intense and lively discussions took place.

