Berkeley Week @ IPMU

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This workshop was held in the framework of the program for Strategic Partnership between the University of Tokyo and the University of California, Berkeley. We invited 4 postdoc researchers from Berkeley to enhance interactions between researchers in the two institutions and 3 students to help organizing the workshop. The workshop consisted of 3 days of talks, on 3/22 (Tue), 24 (Thu), and 25 (Fri), and a reception in the evening of 22 Tuesday. The subject of the workshop was about future of particle physics. Young researchers presented what they consider most interesting. Audience included students at the University of Tokyo, senior faculty members at the Kavli IPMU, Hongo campus, ICRR, KEK, and University of California, Berkeley.

From the Kavli IPMU side, Masaki Yamada, Kazuya Yonekura, Koji Ichikawa, Michihisa Takeuchi, Hajime Fukuda, and Kyohei Mukaida presented talks. Yamada discussed the possibility of building cosmologically safe QCD axion models using monopole condensation. Yonekura presented strongly coupled field theories which may be interpreted as U(1) gauge theories with massless magnetic monopoles and electrons. Ichikawa discussed the future dark matter halo survey of the dwarf spheroidal galaxies and effect of the foreground stars. Takeuchi talked about probing new physics in the top Yukawa sector. Fukuda presented a model which realizes a heavy visible axion, instead of usual light invisible axions. Mukaida discussed the fate of our electroweak vacuum during the preheating era after inflation.

From the Berkeley side, Daniele Bertolini, Yonit Hochberg, Thomas Melia, and Keisuke Harigaya gave talks. In addition, Eric Kuflik from Cornell presented his work. Bertolini discussed a method of doing precision cosmology using effective field theory of large scale structures. Hochberg presented the idea of detecting light dark matter using superconducting detectors. Melia described a method of figuring out operator basis in effective field theories using conformal algebra. Harigaya presented a model in which dark matter of mass of order 10 MeV - 1 GeV is obtained from a light chiral sector. Kuflik discussed displaced vertices at the LHC, especially in the context of R-parity violated supersymmetry and neutral naturalness.

The topics covered by the workshop spanned a wide range of particle physics and cosmology. There were lots of interesting and lively discussions, helping attendees to have new visions on various problems. The workshop was highly successful, and we hope to have similar programs in the future.