CST-MISC Joint International Symposium on Particle Physics

Invited Talk:

Horace W. Crater   (Univ. of Tennessee)
[Title]   Applications of Two Body Dirac Equations to Hadron and Positronium Spectroscopy
[Abstract]   We review recent applications of the Two Body Dirac equations of constraint dynamics to meson spectroscopy and describe new work entailing their use in the study of baryon spectroscopy. We outline unique aspects of these equations for QED bound states among the various other approaches to the relativistic two body problem. Finally we discuss recently discovered new peculiar bound states for positronium.

Jerzy Kowalski-Glikman   (Univ. of Wroclaw)
[Title]   Living in curved momentum space
[Abstract]   Many years ago Max Born put forward a speculative idea that momentum space may have a nontrivial geometry. This idea has been reincarnated recently in the form of the Relative Locality principle. In my talk I will explain how gravity in 2+1 dimensions makes momentum spaces of point particles curved and I will speculate how similar effect may arise from quantum gravity in physical 3+1 dimensions. Then I will describe generic features of the theories with momentum space carrying a nontrivial geometry, in particular to the relaxation of the notion of absolute locality. This talk will be based on my recent review arXiv:1303.0195.

Osamu Jinnouchi   (Tokyo Institute of Technology)
[Title]   Recent Results from the LHC experiments
[Abstract]   Recent results from the LHC experiments are presented, with a focus on the measurements of properties of the Higgs particle and searches for particles beyond the standard model. The future prospect of the LHC in both short and long range are also discussed.

Satoshi Iso (KEK)
[Title]   Naturalness of the 126 GeV Higgs and the cosmological constant
[Abstract]   After the discovery of Higgs boson at 126 GeV and the precise observations of CMB spectrum by Planck satellite, particle physics are now at the stage to search for fundamental principles behind the physics beyond the standard model of particle physics and cosmology. In this talk, I will discuss two important issues, the naturalness of the EW scale and a possible origin of dark energy in the history of the universe.

Nobuyoshi Ohta   (Kinki Univ.)
[Title]   Covariant Approach to the No-ghost Theorem in Massive Gravity
[Abstract]   We discuss the no-ghost theorem in the massive gravity in a covariant manner. Using the BRST formalism and Stückelberg fields, we first clarify how the Boulware-Deser ghost decouples in the massive gravity theory with Fierz-Pauli mass term. Here we find that the crucial point in the proof is that there is no higher (time) derivative for the Stückelberg `scalar' field. We then analyze the nonlinear massive gravity proposed by de Rham, Gabadadze and Tolley, and show that there is no ghost for general admissible backgrounds. In this process, we find a very nontrivial decoupling limit for general backgrounds. We also demonstrate the general results explicitly in a nontrivial example where there apparently appear higher time derivatives for Stückelberg scalar field, but show that this does not introduce the ghost into the theory.