KMI - Theory Seminar

Wednesday, April 17, 2013

3:00 pm, KMI Science Symposia (ES-635)

"Spontaneous supersymmetry breaking in noncritical covariant superstring theory"

Tsunehide Kuroki
KMI, Nagoya University

Abstract:

We study a supersymmetric matrix model with a double-well scalar potential. We point out that its correlation functions exhibit new critical behavior with powers of logarithm. This result suggests that our matrix model provides a nonperturbative definition of the two-dimensional type IIA superstring theory in a certain RR background. Indeed we confirm that correlation functions in both sides agree with each other. Namely, our model can be the first example of nonperturbative formulation of string theory with perturbatively unbroken target space SUSY. Moreover, based on our formulation, we show that the SUSY of the superstring theory will be unbroken in all orders in perturbative theory, but spontaneously broken which shows an interesting possibility that even SUSY in superstring theory can be broken at a nonperturbative level. We also mention our recent numerical results on strong coupling limit of the superstring theory.