Poster Session

1. **T. Asakawa (Hokkaido University)**
   Hopf Algebra Symmetry and String Theory
   Abstract
   We investigate the Hopf algebra structure in string worldsheet theory and give a unified formulation of the quantization of string and the space-time symmetry, where the quantization of string as a Drinfeld twist at the worldsheet level. The equivalence to path integral quantization and the relation to operator formulation are given using normal ordering. In the Minkowski background, space-time diffeomorphism is deformed into a twisted Hopf algebra at the quantum level, while the Poincare symmetry is unchanged. We also discuss about a B-field background.

2. **Y. Baba (RIKEN)**
   OSp invariant superstring field theory
   Abstract
   The OSp invariant closed string field theory is a covariantized version of thelight-cone gauge string field theory. It is made to reproduce the results of light-cone gauge string field theory. In this poster, we review the OSp invariant closed string field theory and discuss its supersymmetrization.

3. **Y. Ishimoto (Okayama Institute for Quantum Physics)**
   The massive perturbation in 2d minimal Liouville gravity and its semiclassical limit
   Abstract
   In our previous work [YI and Al.Zamolodchikov 2006], we have shown that a certain moduli integral vanishes in the gravitationally dressed Ising model. With other values of 4pt functions, we have conjectured a possible form of the partition function of the gravitational Ising model. So far, we have seen the successful development of quantum theories of 2d surfaces coupled to minimal matters, i.e., 2d minimal Liouville gravity. However, no one confirmed whether the semiclassical limit of such quantum theories are correctly identified with their corresponding classical ones in their vicinity. In this presentation, we focus on the semiclassical limit of the gravitational Ising model in the above sense.

4. **I. Kishimoto (RIKEN)**
   Numerical evaluation of gauge invariants in open string field theory
   Abstract
   We construct a class of numerical solutions in a-gauges, which include the Siegel gauge and Landau-type gauge, in open string field theory and evaluate gauge invariants (action and gauge invariant overlap) for them. The result is consistent with the expectation that these solutions are gauge equivalent to Schnabl's analytic solution for tachyon condensation.

5. **K. Miura (Yukawa Institute for Theoretical Physics)**
   Approach to QCD phase diagram from strong coupling lattice QCD
   Abstract
   Based on the strong coupling expansion in the lattice QCD, we investigate the QCD phase diagram at finite temperature and density. In particular, we focus on the phase diagram evolution with the finite coupling effects and the glueball mass at finite temperature.

6. **T. Ochiai (National Institute of Materials Science)**
Berry curvature and optical tornado in photonic crystals
Abstract
A photonic band engineering for controlling the Berry curvature is presented for two-dimensional photonic crystals without space-inversion symmetry. We demonstrate that a large Berry curvature in crystal momentum space generates optical tornadoes in real space. A possible application of the optical tornadoes is also discussed.

7. **S. Pinansky (University of Tokyo)**
Z' boson detection in the Minimal Quiver Standard Model
Abstract
We undertake a phenomenological study of the extra neutral Z' boson in the Minimal Quiver Standard Model and discuss limits on the model's parameters from previous precision electroweak experiments, as well as detection prospects at the Large Hadron Collider at CERN. We find that masses lower than around 700 GeV are excluded by the Z-pole data from the CERN-LEP collider, and below 620 GeV by experimental data from di-electron events at the Fermilab-Tevatron collider. We also find that at a mass of 1 TeV the LHC cross section would show a small peak in the di-lepton and top pair channel.

8. **J. Saito (Hokkaido University)**
Lattice Supersymmetry as a Representation of a Deformed Superalgebra
Abstract
supersymmetry based on a lattice version of superalgebra. Though such an approach, in the first place, seems difficult due to the obvious problem of the Leibniz rule failure, we find that the algebra avoiding the difficulty is in fact given as a Hopf algebra, consistent when represented on a mildly-noncommutative space. These identifications allow us to construct a formal "lattice theory" at least perturbatively.

9. **M. Sakaguchi (Okayama Institute for Quantum Physics)**
Super-Schrödinger-invariant field theories
Abstract
Schrödinger symmetry is a symmetry of non-relativistic conformal field theories (NRCFTs). Recently, NRCFTs have attracted much interest since they may lead to new application of AdS/CFT to condensed matter physics. Schrödinger symmetry in (D+1)-dimensions is known to be related to conformal symmetry in (D+2)-dimensions. We show that supersymmetric Schrödinger symmetry in (D+1)-dimensions can be derived from superconformal symmetry in (D+2)-dimensions. In addition, we discuss non-relativistic limits of the N=3 supersymmetric Chern-Simons matter system in 1+2 dimensions. The relativistic theory can generate several inequivalent super Schrödinger invariant theories, depending on the degrees of freedom we choose to retain in the non-relativistic limit. The maximally supersymmetric Schrödinger invariant theory is obtained by keeping all particle degrees of freedom.

10. **A. Sako (Kushiro National College of Technology)**
Noncommutative Deformation of Topological invariants in Gauge theories
Abstract
We study noncommutative (NC) instantons and vortexes. At first, we construct instanton solutions which are deformations of instanton solutions on commutative Euclidean 4-space. We show that the instanton numbers of these NC instanton solutions coincide with the commutative solutions. Next, we also deform vortex solutions similarly and we show that their vortex numbers are unchanged under the NC deformation.

11. **M. Sano (Hokkaido University)**

On a possibility of Dark matter from Wrapped brane gases

Abstract

We will discuss a possibility of dark matter candidate of wrapped brane gases based on brane gas models of type II string theories. We find wrapped branes whose all spatial parts wrap over cycles of a six-dimensional torus as point particles on a three-dimensional space. In the four-dimensional Einstein frame,it is shown that wrapped D1-branes have a light mass and a weak interaction in term of a RR-flux and a fluctuation of the moduli fields. Then, wrapped D1-brane gases have a possibility of a candidate of the dark matter.

12. **H. Suzuki (RIKEN)**

2d N=(2,2) SYM on computer

Abstract

We numerically studied supersymmetric Ward-Takahashi identities ("PCSC" relation) in Sugino's lattice formulation of the two-dimensional N=(2,2) supersymmetric Yang-Mills theory with a scalar mass term. We obtained a clear evidence that full supersymmetry is restored in the continuum limit of this lattice model. This is a firm demonstration of, for the first time to our knowledge, realization of supersymmetry in lattice gauge theory. As physical application, we numerically observed that certain correlation functions related by supersymmetry exhibit a power-like behavior (which implies the absence of mass gap) and the static potential between probe charges in the fundamental representation is linearly-rising. The latter confining behavior appears distinct from a theoretical conjecture made in the '90s by Armoni, Frishman and Sonnenschein, although the static potential for larger distance has to be systematically explored. This presentation is based on collaboration with Issaku Kanamori.

*For talkers of the poster session
You can put your posters on the board in the morning.