Monday 24 November 2008

top

09:00 Registration (1h00') (Location: coffee room)

10:00 Coffee & Tea (coffee room)

10:30 Current status of link approach for the twisted SUSY on a lattice (1h00') KAWAMOTO

12:30 Lunch (Niels Bohr Institute Canteen)

14:15 Schwarzschild radius and black hole thermodynamics with alpha' corrections from simulations of SUSY matrix quantum mechanics (1h00') NISHIMURA

We present new results from our Monte Carlo simulation of SUSY matrix quantum mechanics with 16 supercharges at finite temperature. The internal energy can be fitted nicely to the behavior predicted from the dual black hole thermodynamics including the alpha' corrections. The temporal Wilson loop can also be predicted from the gravity side, and it is directly related to the Schwarzschild radius of the dual black hole geometry. Our results for the Wilson loop indeed confirm this prediction up to subleading terms anticipated from the alpha' corrections on the gravity side. All these results give us strong support and a firm basis for the idea to use matrix model simulations to study quantum gravity.

15:30 Coffee & Tea (coffee room)

Tuesday 25 November 2008

top

10:00 Coffee & Tea (coffee room)

10:30 Numerical simulation of N=1 supersymmetric Yang-Mills theory using domain wall fermions (1h00') ENDRES

I will present results from a numerical study of N=1 supersymmetric Yang-Mills theory using domain wall fermions. In this particular lattice formulation of the theory, supersymmetry is expected to emerge accidentally in the continuum and chiral limits without fine-tuning of operators. Results from this study will include measurements of the static potential, residual mass, gluino condensate as well as some preliminary measurements of the spectrum.

12:30 Lunch (Niels Bohr Institute Canteen)

14:15 Supersymmetric lattices: theory and simulation (1h00') CATTERALL

I discuss the connection between orbifolded and twisted constructions of supersymmetric lattices and present preliminary numerical results from simulations of Q=4 and Q=16 supercharge theories in a variety of dimensions.

15:30 Coffee & Tea (coffee room)

Wednesday 26 November 2008

top

10:00 Coffee & Tea (coffee room)

10:30 Some new ideas about lattice SUSY (1h00') D'ADDA

I shall review the successful features of the so called "link approach" and analyse some points that have been criticized in the literature, in particular the link nature of supercharges and the use of modified Leibnitz rules. Some new ideas, that should allow, at least in some cases, to treat supersymmetry on the lattice exactly like a discrete translational symmetry, will be exposed.

12:30 Lunch (Niels Bohr Institute Canteen)

14:15 Lattice Supersymmetry from Blocking transformations (1h00') BRUCKMANN

15:30 Coffee & Tea (coffee room)

Thursday 27 November 2008

top

10:00 Coffee & Tea (coffee room)

10:30 Relation among Supersymmetric Lattice Gauge Theories (1h00') MATSUURA

Recently, several schemes to define gauge theories with exact supersymmetry on a space-time lattice have been developed. I will show that these seemingly different schemes are related with each other and the so-called orbifolding

procedure gives the unifying framework. I will also mention on the supersymmetric Wilson loop in the orbifold lattice theory.

12:30 Lunch (Niels Bohr Institute Canteen)

14:15 2d N=(2,2) SYM in the machine (1h00') SUZUKI

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 to conclude real asymptotic behavior. This presentation is based on collaboration with Issaku Kanamori.

15:30 Coffee & Tea (coffee room)

18:30 Workshop Dinner ([] ([]))

Friday 28 November 2008

top

10:00 Coffee & Tea (coffee room)

10:30 Ginsparg-Wilson formulation of 2D N=(2,2) SQCD with exact supersymmetry (1h00') SUGINO

In this talk, I will discuss on lattice formulations of 2D N=(2,2) SQCD preservng one of the supercharges.
In particular, the overlap Dirac operator, which satisfies the Ginsparg-Wilson relation, is introduced to the matter sector of the theory.
It realizes the exact chiral flavor symmetry on the lattice, to make possible to define the lattice action for general number of the flavors of fundamental and anti-fundamental matter multiplets and for general twisted masses.
Furthermore, superpotential terms can be introduced with exact holomorphic or anti-holomorphic structure on the lattice.
I will also discuss the lattice formulation of matter multiplets charged only under the central U(1) (the overall U(1)) of the gauge group G=U(N), and then construct lattice models for gauged linear sigma models with exactly preserving one supercharge and their chiral flavor symmetry.

12:30 Lunch (Niels Bohr Institute Canteen)

15:30 T talk at NBIA (1h00') (Location: coffee room)