

LABORATOIRE DE PHYSIQUE THÉORIQUE
DE
L'ÉCOLE NORMALE SUPÉRIEURE

XXXV^{ème} INSTITUT D'ÉTÉ
“THÉORIES DES CORDES
ET
THÉORIES DE JAUGE SUPERSYMMÉTRIQUES”

8-19 août 2005

Liste des participants

Gleb ARUTYUNOV	Vladimir BAZHANOV
Niklas BEISERT	Denis BERNARD
Curtis CALLAN	Miguel COSTA
Nicolas COUCHOUD	François DAVID
Jean-Pierre DERENDINGER	Michael DOUGLAS
Burkhard EDEN	Manolis FLORATOS
Lisa FREYHULT	Sergey FROLOV
Nikolai GROMOV	Chris HULL
Ken INTRILIGATOR	Elias KIRITSIS
Thomas KLOSE	Gregory KORCHEMSKY
Charlotte KRISTJANSEN	George LEONTARIS
Lev LIPATOV	Stamatios NICOLIS
Luciano MAIANI	Teresia MANSSON
Ioannis PAPADIMITRIOU	Joao PENEDONES
Marios PETROPOULOS	Jan PLEFKA
Eliezer RABINOVICI	Henning SAMTLEBEN
Yuji SATOH	Sakura SCHAFFER-NAMEKI
Albert SCHWARZ	Samson SHATASHVILI
Matthias STAUDACHER	Ian SWANSON
Theodore TOMARAS	Arkady TSEYTLIN
Pierre VAN HOVE	Erik VERLINDE
Marija ZAMAKLAR	Konstantin ZAREMBO

Organisateurs

E. CREMMER	V. KAZAKOV	K. SAKAI
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*Les séminaires auront lieu en CONF IV au
Laboratoire de physique théorique de l'école normale supérieure
24 rue Lhomond Paris(5ème)*

Lundi 8 août

11h00 - Lev LIPATOV (St Petersburg)

Regge and Bjorken asymptotics in the perturbative approach to gauge models and integrability

Abstract: "I give a review of the perturbative approach to the high energy asymptotics of scattering amplitudes in QCD and in its supersymmetric generalizations based on the BFKL and DGLAP equations. In particular I discuss the remarkable mathematical properties of the BFKL dynamics in the leading logarithmic approximation for the multi-colour QCD: Moebius invariance, holomorphic separability, duality symmetry and integrability. In the next-to-leading approximation some of these properties are conserved only in N=4 SUSY. The anomalous dimensions of the twist-2 operators related directly to the kernels of the DGLAP equation are calculated in N=4 SUSY up to the 3-loop approximation. The integrability of the equations for the anomalous dimensions of the quasi-partonic operators in the multi-colour limit of this model is also discussed."

14h30 - Gregory KORCHEMSKY (Orsay)

Integrability in (super)Yang-Mills theory on the light-cone

Informal seminar **16h30 - Kazuhiro SAKAI** (LPTENS)

Duality in supersymmetric Bethe ansatz equations

Mardi 9 août

11h00 - Curtis CALLAN (Princeton)

The AdS/CFT correspondence in the near-BMN limit: an introduction

14h30 - Thomas KLOSE (Golm)

Perturbative Integrability of large N Matrix Theories

Abstract: "The exploration of the AdS/CFT correspondence received a fresh impetus after J. Minahan and K. Zarembo found integrability properties in N=4 supersymmetric Yang-Mills theory three years ago. This integrability is described most conveniently, when the planar dilatation operator of this conformal theory is considered as a spin-chain Hamiltonian. Even though an enormous progress has been made in understanding and utilizing the uncovered integrable structures, their fundamental origin and the precise mechanism of symmetry enhancement in the planar limit is still unclear. In this talk, we review recent studies of quantum mechanical matrix theories and their contribution to a better insight into perturbative integrability. We derive two matrix models from super Yang-Mills theory and recall how the associated spin-chain Hamiltonians are determined. We investigate these spin-chain systems with respect to integrability and present new results."

Informal seminar **16h30 - Marija ZAMAKLAR** (Golm)

Comparison between quantum string Bethe equations and semiclassical strings

Mercredi 10 août

11h00 - Konstantin ZAREMBO (Uppsala)

Bethe ansatz in AdS/CFT: from local operators to classical strings

14h30 - Gleb ARUTYUNOV (Utrecht)

New integrable system of 2-dim fermions from strings on $AdS_5 \times S^5$

Informal seminar **16h30 - Ian SWANSON** (Pasadena)

Investigating Integrability in $AdS_5 \times S^5$

Jeudi 11 août

11h00 - Matthias STAUDACHER (Golm)

Bethe ansätze for higher loop gauge theory and quantum strings

14h30 - Sergey FROLOV (Golm)

Strings in gamma-deformed AdS/CFT

Informal seminar **16h30 - Lisa FREYHULT** (Copenhagen)

Finite size effects: fluctuations and energy shifts in the Bethe ansatz

Vendredi 12 août

11h00 - Niklas BEISERT (Princeton)

Integrability for complete AdS/CFT and $PSU(2,2/4)$ symmetry

14h30 - Arkady TSEYTLIN (Londres)

AdS/CFT duality for deformation of $N = 4$ SYM theory

Informal seminar **16h30 - Burkhard EDEN** (Golm)

The Konishi anomaly and the anomalous dimension of BMN multiplets

Lundi 15 août

HOLIDAYS

Mardi 16 août

11h00 - Albert SCHWARZ (Davis/IHES)

Space and Time from translation invariance

14h30 - Joao PENEDONES (Corto/LPTENS)

Hagedorn transition and chronology protection in String theory

Abstract: "We conjecture chronology is protected in string theory due to the condensation of light winding strings near closed null curves. This condensation triggers a Hagedorn phase transition, whose end-point target space geometry should be chronological. Contrary to conventional arguments, chronology is protected by an infrared effect. We support this conjecture by studying strings in the O-plane orbifold, where we show that some winding string states are unstable and condense in the non-causal region of spacetime. The one-loop string partition function has infrared divergences associated to the condensation of these states."

Mercredi 17 août

11h00 - Erik VERLINDE (Amsterdam)

Topological Strings and Microstates of 5D and 4D Black Holes

Abstract: "The microstates of 5D extremal black holes have been well understood for 1/4 BPS states in theories with 16 supercharges. Their number can be expressed in terms of the elliptic genus of a symmetric product space. In theories with 8 supercharges the number 1/2 BPS states in D=5 is related to the Gromov-Witten invariants computed by the topological string. After reviewing these facts, I will describe different approaches to the counting of black hole microstates in D=4."

14h30 - Eliezer RABINOVICI (Jerusalem)

Phases of quantum gravity: AdS_3 and linear dilaton backgrounds

Jeudi 18 août

11h00 - Michael DOUGLAS (Rutgers/IHES)

Introduction to statistics of vacua

14h30 - Chris HULL (London)

Duality and non-geometric string configurations

Vendredi 19 août

11h00 - Henning SAMTLEBEN (Hambourg)

Gauging, duality and magnetic charges

14h30 - Ken INTRILIGATOR (San Diego)

The super R-symmetry and AdS/CFT