Workshop INFN-SPAIN 2012, Napoli

— Programme —

Monday November 12

9.30 – 10.30 Franco Pezzella *T-duality invartiant formulation of bosonic closed strings*

It is well-known that bosonic closed string theory is invariant under T-duality transformations. In the simplest case of only one dimension compactified on a circle of radius R, this symmetry suggests that such a compactification is equivalent to the one on the T-dual circle with radius $\hat{R} = \alpha'/R$, giving a clear indication that ordinary geometric concepts can break down in string theory at the string scale. In this talk a formulation of the closed string theory will be discussed in which the string coordinates and their T-duals are considered as independent 2D fields. In such a framework the analog of the Ricci term in the manifestly T-duality symmetric gravitational effective action is derived.

10.30 – 11.00 Coffee break

11.00 – 12.00 Dimitri Sorokin *Non-linear deformations of duality-symmetric theories*

We shall describe a systematic way of the generalization, to models with non-linear duality, of the space-time covariant and duality-invariant formulation of duality-symmetric theories in which the covariance and the consistency of the construction are ensured by the presence of a single auxiliary scalar field and two local symmetries. Application of this method to the study of the role of duality-invariant counterterms in the UV behavior of quantum supergravities will be discussed.

12.00 – 13.00 Carlos Meliveo *Supermembrane interaction with dynamical D=4 N=1 supergravity. Superfield Lagrangian description and spacetime equations of motion*

We obtain the complete set of equations of motion for the interacting system of supermembrane and dynamical $D = 4$ $\mathcal{N} = 1$ supergravity by varying its complete superfield action and writing the resulting superfield equations in the special gauge where the supermembrane Goldstone field is set to zero. We solve the equations for auxiliary fields and discuss the effect of dynamical generation of cosmological constant in the Einstein equation of interacting system and its renormalization due to some regular contributions from supermembrane. These two effects (discussed in late 1970s and 1980s, in the bosonic perspective and in the supergravity literature) result in that, generically, the cosmological constant has different values in the branches of spacetime separated by the supermembrane worldvolume.

13.00 Lunch

Tuesday November 13

9.30 – 10.30 Tomas Ortin Miguel *Some new results on extremal and non-extremal black holes*

I will review some recent results on the construction of extremal and non-extremal black-hole solutions in 4- and 5-dimensional ungauged supergravity theories. I will resent the HFGK formalism that simlpifies the construction of explicit solutions and the study of

properties of general families of solutions in $\mathcal{N} = 2$ theories, I will present some new results on the hidden conformal symmetry of non-extremal black-hole solutions, the use of black-hole solutions to construct Lifshiftz-like solutions with hyperscaling violation and also on the metric of the most general supersymmetric black-hole solutions of $\mathcal{N} = 8$, $d = 4$ supergravity.

10.30 − 11.00 Coffee break

11.00 − 12.00 Alfonso Ramallo *Holographic flavors in Chern-Simons-matter theories*

After reviewing the holographic dual of $\mathcal{N} = 6$ Chern-Simons- matter theory, we will analyze the addition of flavors and the modification of the supergravity dual that they induce, following the approach of the paper 1105.6045. We will then construct the corresponding flavored black hole and we will study the thermodynamic properties of brane probes and of the meson melting transition that they undergo at a certain critical temperature.

12.00 − 13.00 Wolfgang Mück *D5-branes and quantum impurity models*

It is well known that $\mathcal{N} = 4$ SYM operators in the rank-k antisymmetric representation are described holographically by D5-branes, which carry k units of fundamental string charge. This fact has been used in the past to calculate the expectation value of circular Wilson loops of such operators, which agrees with the result of matrix model calculations. Similar D5-brane configurations describe Wilson loop correlators and, at finite-temperature, Polyakov loops and holographic dimers. In this talk, it is argued that the above systems can be fruitfully described by what can be called a supersymmetric Kondo model.

13.00 Lunch

Wednesday November 14

9.30 − 10.30 Jose Adolfo de Azcarraga *Some new results on n-Leibniz algebras and n-Lie systems*

Two types of higher order Lie k-ple systems are introduced. They are defined by brackets with $k > 3$ arguments satisfying certain conditions, and generalize the known Lie triple systems. One of the generalizations uses a construction which allows us to associate a $(2n − 3)$-Leibniz algebra with a metric n-Leibniz algebra by using the $2(n − 1)$-linear Kasymov trace form. Some specific types of Leibniz algebras, relevant in the construction, are introduced as well. Both higher order Lie k-ple generalizations reduce to the standard Lie triple systems for $k = 3$.

10.30 − 11.00 Coffee break

11.00 − 12.00 Igor Bandos *Covariant action for the eleven dimensional supersymmetric multiple M0-brane system*

We present the covariant supersymmetric and kappa-symmetric action for a system of N nearly coincident M-waves (multiple M0-brane system) in flat eleven dimensional superspace.

12.00 − 13.00 Discussion

13.00 Lunch