Name	Institution/Talk/Abstract
Adi Armoni	Swansea University (UK) "(Almost-) Tensionless Confining Strings" The vacuum structure and dynamics of multi-flavour charge Q two-dimensional QED will be discussed. Interestingly, in 2d integer charges can screen fractional charge. I will discuss this phenomenon in both field theory and in a string embedding of the theory. Using non-perturbative results in 2d a non-perturbative result in string theory is obtained. The talk is based on a recent paper written in colaboration with Shigeki Sugimoto.
Stefano Baiguera	Università degli Studi di Milano-Bicocca "Complexity for warped AdS black holes" In this talk I will review the complexity=volume and complexity=action conjectures proposed by Susskind and collaborators. Then I will describe some aspects of black holes living in asymptotically warped Anti-de Sitter spacetime, seen as a solution of Einstein gravity plus matter. Finally, I will compute both the spatial volume of the Einstein-Rosen bridge and the gravitational action in the Wheeler-De Witt patch for these black holes. The growth rate of complexity in the two cases is proportional to the Hawking temperature times the Bekenstein-Hawking entropy, a result consistent with expectations about computational complexity in the boundary theory.
Salvatore Baldino	Instituto Superior Tecnico (Portugal) "Resurgent analysis and its applications to Physics" In this talk, we will illustrate why resurgent analysis is a promising framework for studying non perturbative aspects of physical theories. We will present examples from mathematics and physics in which resurgence has been successfully applied, and why resurgence is a very good tool for understanding phase diagrams of physical systems. We will then talk about the basic ideas of resurgence, showing how the non perturbative information is encoded in the perturbative asymptotic series and the concept of the Stokes phenomenon. We will conclude the exposition by presenting ongoing work in the context of Painlevé equations, that are related to the partition function of 2D gravity and supergravity.
Marco Barsanti	University of Pisa and INFN "Near-BPS baby Skyrmions as nuclear model" The Skyrme Model represents a successful attempt to describe the low-energy regime of the theory of strong interactions (QCD). In this model baryons and nuclei emerge as topological solitons (Skyrmions) of the theory. Despite some relative accurate results in describing nucleons, the Skyrme Model seems unable to reproduce the small binding energy in nuclei. This result suggests the necessity of building new Skyrme-like models in which the interactions among the Skyrmions must be weaker. The Near-BPS models represent a promising example of these new theories. In this talk I will discuss a 2D Near-BPS baby Skyrmion model in which a Dirichlet term is added as a small perturbation to the BPS sector. Solutions for different topological sectors are studied using both a perturbative expansion near a BPS background and numerical calculations for the complete theory. The results of this work may be adapted for a more complicated 3D Near-BPS Skyrmion model.
Francesco Benini	SISSA, Trieste ''Domain Walls in Super-QCD'' Four-dimensional Yang-Mills and (massive) QCD with minimal N=1 supersymmetry are theories with multiple gapped vacua. Therefore, different regions of space can sit in different vacua and be connected by BPS domain walls. I will present a compact 3D worldvolume description of the walls, capable of classifying all possible BPS walls between vacua and of capturing a 2nd order phase transition as the quark mass is varied. Such a proposal will be confirmed by explicit 4D constructions of BPS domain walls, extending the existing literature.
Sergio Benvenuti	SISSA, Trieste ''Merging of fixed points in Chern-Simons-QCD3''

Fabrizio Canfora

CECS, Valdivia (Chile)

"From gravitating Skyrmions to flat Skyrmions at finite density"

In this talk I will describe a method which allowed recently to construct the first analytic examples of gravitating Skyrmions (namely smooth solutions of the Einstein-Skyrme system with non-vanishing topological charge). Using a suitable change of variables, it is possible to map these gravitating Skyrmions into flat Skyrmions living at finite Baryon density. Using a similar approach it is also possible to construct the first analytic examples of gauged Skyrmions. The physical properties of these solitons will be shortly described.

Aleksey Cherman

University of Minnesota (USA)

"Comments on Higgs-confinement complementarity"

Massimo D'Elia

University of Pisa and INFN

''Topological properties of QCD-like theories''

Minoru Eto

Yamagata University (Japan)

''Topological Z-strings and magnetic monopoles in two Higgs doublet models''

We show that a stable magnetic monopole with a finite mass can exist in two Higgs doublet models, contrary to the standard model. The monopole is attached by two topological Z strings (Z flux tubes) from both sides. After analytically constructing an asymptotic form of such a configuration, we explicitly construct a solution of the equation of motion based on a 3D numerical simulation in which magnetic fluxes spherically emanating from the monopole at large distances are deformed in the vicinity of the monopole.

Luiz Agostinho Ferreira

Instituto de Fisica de Sao Carlos, IFSC/USP (Brazil)

''The Yang-Mills Integral Equations''

Despite the fact that the integral form of the equations of classical electrodynamics is well known, the same is not true for non-abelian gauge theories. In this talk we present the integral form of the classical Yang-Mills equations in the presence of sources and then use it to solve the long standing problem of constructing non-abelian electric and magnetic conserved charges, for any field configuration, which are invariant under general gauge transformations. The construction is based on concepts in loop spaces and on a generalization of the non-abelian Stokes theorem for two-form connections, which resemble the techniques used in integrable field theories. The Yang-Mills equations is written as the zero curvature condition for a connection in a two-loop space. The charges are explicitly evaluated for monopoles and dyons. In the case of the Wu-Yang monopole the integral equations imply that such a solution needs a unique point source to be self-consistent. Our results are important in the understanding of global properties of non-abelian gauge theories.

Peter Forgacs

Wigner RCP (Hungary)

''Gravitationally bound breathers in asymptotically AdS space-times''

Ivan Garozzo

Università di Milano-Bicocca

''S-Fold SCFTs and Supersymmetry enhancement''

A large class of 3d SCFTs can be engineered inserting a local SL(2,Z) duality wall into the Type IIB brane system leading to the so called S-fold SCFTs. These theories are intrinsically non Lagrangian, due to the gauging of the global symmetries of a SCFT, thus playing the role of non-conventional matter. In this talk I will discuss the main features of S-fold SCFTs, focusing on their moduli space and how mirror symmetry relates them. The construction of these theories can be extended to various gauge groups, and in particular I will discuss the ones involving gauge group. Moreover, the issue of the amount of supersymmetry these theories possess in the IR will be addressed employing the computation of the supersymmetric index.

Simone Giacomelli

University of Oxford (UK)

''Infrared enhancement of supersymmetry in four dimensions''

In this seminar I will discuss a recently-found class of RG flows in four dimensions exhibiting enhancement of supersymmetry in the infrared, which provides a lagrangian description of several strongly-coupled N=2 SCFTs. The procedure involves starting from a N=2 SCFT, coupling a chiral multiplet in the adjoint representation of the global symmetry to the moment map of the SCFT and turning on a nilpotent expectation value for this chiral. We show that, combining considerations based on 't Hooft anomaly matching and basic results about the N=2 superconformal algebra, it is possible to understand in detail the mechanism underlying this phenomenon and formulate a simple criterion for supersymmetry enhancement.

Christopher Halcrow

University of Leeds (UK)

''Skyrmion Scattering manifolds''

Low energy soliton scattering takes place on some manifold of field configurations. For special systems (such as critically coupled vortices or BPS monopoles) the manifold is well known: it is the moduli space. In this case, if a soliton has k zero modes, the scattering manifold for N solitons has dimension Nk. Such a manifold is harder to construct for the Skyrme model, which does not have a special mathematical structure. In this talk, I will try and define what a useful scattering manifold is. Using this definition I will argue that the Skyrmion space cannot have dimension Nk, and provide evidence that there are consistent spaces with dimension N(k+1) and N(k+2)-1.

Edwin Ireson

University of Minnesota (USA)

''Composite Non-Abelian String dynamics: the Grassmannian and Flag manifold Sigma Models''

The elementary BPS non-Abelian string, with one unit of flux of one specific colour, possesses an internal moduli, leftover from 4D gauge invariance: it is a point on the projective manifold CP(N) and a low-energy effective action for the dynamics of this string can be shown to include a CP(N) sigma model, written in various presentations. We fully investigate the case of composite non-Abelian strings, which bear multiple units of flux of multiple colours, construct a string solution in four dimensions and observe the 2D effective action for their dynamics, which involve generalisations of CP(N), the Grassmannian and Flag manifolds.

Etsuko Itou

Keio University (Japan)

''Lattice study on the CP^{N-1} models on R x S^1''

Steffen Krusch

University of Kent (UK)

"Vibrational Quantisation of Skyrmions"

In this talk, I will introduce the Skyrme model and describe how to semi-classically quantise it. I will focus first on the zero mode quantization and then describe vibrational quantisation. I will discuss recent results for carbon 12 and oxygen 16.

Prem Kumar

Swansea University (UK)

''Chern-Simons matter theory at finite density''

I will discuss Chern-Simons + scalar field theories in 2+1 dimensions with a finite chemical potential for particle number. The ground state of this system is a novel colour-flavour locked vacuum with background VEVs for both gauge and scalar fields. The perturbative spectrum of the theory contains phonon modes with roton minima in their dispersion relations, while the matrix VEVs for the gauge fields match with the droplet ground state of the Abelian quantum Hall matrix model. I will discuss properties of semiclassical vortices in this system.

Andrea Luzio

Universita' di Pisa e INFN

''Gauging one-form Z_k center symmetries in some simple SU(N) gauge theories''

Marco Matone

Università di Padova

''Classical-Quantum Dualities From Path Integral''

We show that the path integral formulation has a natural classical quantum duality. In particular, it turns out that classical theories correspond to a path integral of a dual non-local quantum theory.

Carlos Naya Rodriguez — INFN-Lecce

''Light nuclei in an extended Skyrme model with rho mesons''

I will present the last results of the extended Skyrme model coupled to an infinite tower of vector mesons which comes from a pure Yang-Mills theory in one higher dimension. We will see how two of the main issues in the standard Skyrme model, namely high binding energies and lack of clustering structures, are mitigated with just the inclusion of the lightest vector meson, the rho meson.

Keisuke Ohashi — Keio university (Japan)

''Large-N CP^{N−1} sigma model on a Euclidean torus: uniqueness and stability of the vacuum''

Silvia Penati — Università di Milano-Bicocca

''A Galilean Wess-Zumino model in three dimensions''

I will present the renormalisation properties of the N=2 Wess-Zumino model in a non-relativistic 2+1 space-time. Quite unexpectedly it exhibits much better UV behaviour than the relativistic model. In fact, I will provide evidence that it is one-loop exact.

Erich Poppitz — University of Toronto (Canada)

"Higher form symmetry 't Hooft anomalies, phases, and domain walls"

I will introduce and review the 't Hooft anomalies of (discrete) higher form symmetries in gauge theories. Then, I will discuss various implications to phases of gauge theories (in both 2 and 4 dimensions) and the physics of domain walls.

Yakov Shnir — JINR (Russia)

"Interaction of topological solitons mediated by fermions"

Martin Speight — University of Leeds (UK)

"Skymions coupled to omega mesons"

Yuya Tanizaki — North Carolina State University (USA)

''Vacuum structure of 2d adjoint QCD revisited''

I want to discuss the possible vacuum structures of two-dimensional adjiont QCD by using the help of new anomaly matching conditions. We find several interesting anomalies that involve center symmetry, fermion parity, and chiral symmetry for massless adjoint fermions. This requires not only the spontaneous breaking of discrete chiral symmetry, but also an interesting domain-wall physics, which leads to a partial deconfinement Z_N->Z_{N/2} for even number of colors N.

Andrzej Wereszczynski — Jagiellonian University (Poland)

''Self-dual impurities''

Wojciech Zakrzewski — University of Durham (UK)

"Some properties of two interacting Sine-Gordon BPS fields in (1+1) dimensions"

In this talk we will discuss various properties of kink/kink and kink/antikink solutions of the BPS fields of such a model. We will discuss the interactions of such solitons and also point out some interesting and unexpected properties of the numerical solutions of such systems.