SEMPARIS – Séminaires en région parisienne

http ://string.lpthe.jussieu.fr/semparis/

Cours

Vendredi 15 Avril 2016, 10 :00
IPHT, Salle Claude Itzykson, Bât. 774, Orme des Merisiers
Domaines : hep-th—physics

Titre : *Quantum integrability : old and new tools (3/6)*

Orateur : **Didina Serban And Dmytro Volin (IPhT and Trinity College Dublin)**

Résumé : *In recent years, the spectral problem of planar N=4 Super Yang-Mills quantum field theory (N=4 SYM) was understood with a great precision, giving the opportunity to check an example of the Anti de Sitter/Conformal Field Theory (AdS/CFT) correspondence in unexpected detail. The spectacular advancements in this four-dimensional interacting gauge theory were enabled by the presence of hidden integrable structures. The progress was achieved through a decade-long effort of the scientific community that had combined old ideas from integrable spin chains and twodimensional sigma models with new ones. In this course we aim to show how the new and old ideas work together producing a solution of the planar N=4 SYM spectral problem in terms of the q uantum spectral curve (QSC).*

1) XXX spin chain, algebraic/coordinate Bethe ansatz, T-Q relations.
2) Quasiclassical limit : sigma models, Lax connection, finite gap solution.
3) Oscillator representation of psu(2,2|4) and the N=4 SYM spectrum.
4) Q-system for rational spin chains. Hirota equation on T-hooks and geometry behind its Wronskian solution.
5) AdS/CFT quantum spectral curve (QSC) as a Q-system and as a Riemann-Hilbert problem.
6) Explicit solution of QSC in different regimes, perturbative analytic computations, multiple zeta values, and the 10-loop Konishi anomalous dimension.

(cf. details in joined file : "2016_Serban+Volin.pdf".)