Contribution ID: **210** Type: **Oral presentation**

Subleading corrections to the BFKL equation: singlet versus color adjoint state.

Saturday 7 July 2018 17:00 (30 minutes)

The Balitsky-Fadin-Kuraev-Lipatov equation presents a bound state of two reggeized gluons and is already known to the leading order for four decades. Its subleading corrections at the next-to-leading (NLO) level are also known both in QCD and maximally supersymmetric theory (SUSY N=4) for more than two decades. Going beyond the NLO order presents in general a non-trivial task and still to be found for QCD. However, in some simpler cases like the BFKL equation in the color adjoint state in SUSY N=4 subleading corrections are recently became available at any order of the perturbation theory. Their calculations are based on advanced integrability techniques and an educated guess work.

The integrability was first introduced in the particle physics by Lev Lipatov while solving the leading order singlet BFKL equation using conformal invariance in the coordinate space. Surprisingly the color adjoint BFKL equation possesses a similar conformal symmetry, but in the transverse momentum space. This minor, at first sight, difference results in a completely different space of functions, which builds the BFKL eigenvalue at the next-to-leading order. The color adjoint BFKL turns out to be much simpler mostly due to a variety of identities between generalized polygamma functions with integer (color adjoint) versus half-integer (color singlet) shifts or the argument.

In this talk we discuss the possible space of functions for the higher order corrections and show how they can be constructed from a simpler functions using so called reflection identities.

The major part of the talk is dedicated to the contribution of Lev Lipatov to the present understanding of the high energy scattering and his bright, still-to-be-realized, ideas regarding the future developments in this field and beyond.

Primary author: Dr PRYGARIN, Alex (Ariel University)

Presenter: Dr PRYGARIN, Alex (Ariel University)

Session Classification: Lev's Lipatov memorial session