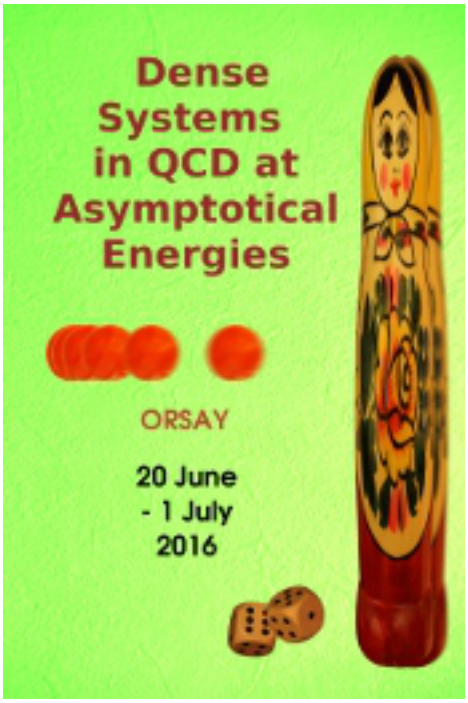
Dense systems in QCD at asymptotical energies



lundi 20 juin 2016 - vendredi 1 juillet 2016

Laboratoire de Physique Théorique, Orsay

Programme Scientifique

session:** Formal developments in small-x_{Bj} physics: k_T-factorization, saturation, color-glass condensate**

**Dmitry Yu. Ivanov, **Sobolev Institute of Mathematics and Novosibirsk State University, Novosibirsk (Russia)

The BFKL Reggeon approach (6h)

Starting from the historical BFKL approach at LL, this series of lectures will describe the key concepts of the field (QCD reggeon, Lipatov vertex, the BFKL equation, the notion of impact factor, non-sense polarizations...) and will give an introduction to NLL BFKL.

**Andrey V. Grabovsky, **Budker Institute of Nuclear Physics and Novosibirsk State University, Novosibirsk (Russia)

The QCD shock-wave approach (6h)

Starting from the concept of Wilson lines in QCD, this series of lectures will cover the QCD shock-wave approach, constructing explicitly the Balitsky's hierarchy and the related Balitsky-Kovchegov equation.

**Heribert Weigert, **University of Cape Town (South Africa)

The JIMWLK approach (6h)

This series of lectures will elaborate on the concept of Color Glass Condensate, described through the JIMWLK equation.

**Tolga Altinoluk, **CENTRA, Lisbon (Portugal)

The hamiltonian approach (4.5h)

The physics of saturation will be covered in the hamiltonian formalism.

**Stéphane Munier, **CPhT, Palaiseau (France)

Statistical physics in QCD evolution at high energies (4.5h)

This series of lectures will cover the QCD dipole model and its fruitful relation with reaction-diffusion processes of statistical physics.

session:** Formal developments in heavy ions physics**

**François Gelis, **IPhT, Gif-sur-Yvette (France)

Thermalization aspects of heavy-ions collisions (3h)

This series of lectures will describe the early stages of heavy ion collisions

at high energy in the Color Glass Condensate framework.

**Stéphane Peigné, **SUBATECH, Nantes (France)

Induced coherent radiation in a QCD medium (4.5h)

In this series of lectures, we will review the basics of QED and QCD bremsstrahlung, describe the pictorial technique to calculate efficiently color factors and projectors, and finally use this knowledge to derive the medium-induced gluon radiation spectrum of a fast parton (or parton pair) scattering eikonally off a nucleus.

session:** Phenomenological aspects**

**Krzysztof Golec-Biernat, **Institute of Nuclear Physics, Cracow, and

Faculty of Mathematics and Natural Sciences, Rzeszów (Poland)

(Cancelled)

Javier L. Albacete, University of Granada (Spain)

Phenomenology of saturation (4.5h)

This series of lectures will cover the phenomenology of saturation in proton deep inelastic scattering and heavy ions collisions, from theory to models.

Elena Gonzalez Ferreiro, University of Santiago de Compostela (Spain)

Cold-nuclear matter effects and jet fragmentation (3h)

These lectures will cover the phenomenology of parton propagation, energy loss and hadronization in heavy ions collisions.

session:** Reconciling high-energy resummations with collinear factorization **

Bo-Wen Xiao, Central China Normal University, Wuhan (China)

Small-x_{Bj} physics and TMDs (6h)

This series of lectures will show how resommation effects à la Sudakov appear in small-x_{Bj} physics and can be consistently evaluated, in the framework of TMDs.