Jet evolution in a dense QCD medium

**Titre :** Jet evolution in a dense QCD medium

**Orateur :** Paul Cauca (IPHT)

**Résumé :** To probe the properties of the quark-gluon plasma created in heavy-ion collisions, a very useful class of observables refers to the propagation of energetic jets. A jet is a collimated spray of particles generated via successive parton branchings, starting with a virtual quark or gluon produced by the collision. When such a jet is produced in the dense environment of a nucleus-nucleus collision, its interactions with the surrounding medium lead to a modification of its properties, phenomenon known as jet quenching. In this thesis, we develop a new theory to describe jet quenching. We compute for the first time the effects of the medium on multiple vacuum-like emissions, that is emissions triggered by the virtuality of the initial parton. We present a new physical picture for jet evolution, with notably a factorization in time between vacuum-like emissions and medium-induced emissions. This picture is Markovian, hence well suited for a Monte-Carlo implementation that we develop in the parton shower JetMed. We then investigate the phenomenological consequences of our new picture on jet observables and especially the jet nuclear modification factor $R_{AA}$, the SoftDrop $z_g$ distribution and the jet fragmentation function. Our Monte-Carlo results are in good agreement with the LHC measurements.
The theory of Bridgeland stability conditions has seen important developments in the past few years. Emerging from the mathematical physics literature, in particular in Douglas’ work, it now connects to different branches in mathematics including symplectic geometry and representation theory.

In this talk we will give a quick introduction to the basic theory of stability conditions for the derived category of coherent sheaves on a smooth projective variety, focusing on the recent advances in the threefold case; in particular, on the existence result for the quintic Calabi-Yau threefold.

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Mardi 29 Septembre 2020, 11 :00
IPHT, Salle Claude Itzykson, Bât. 774
Séminaire du IPHT
Domaines : physics

Titre : Ordinateurs quantiques, Menaces et Opportunités

Orateur : Nicolas Sangouard ( IPhT )

Résumé : (TBA)

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Mardi 6 Octobre 2020, 14 :00
LPTHE, library
Particle Physics at LPTHE
Domaines : hep-ph

Titre : TBA

Orateur : Eric Laenen ( Nikhef )