

PhD Day 1

Rapport sur les contributions

ID de Contribution: **1**

Type: **Non spécifié**

Introduction

mardi 25 avril 2023 10:00 (30 minutes)

Orateur: Mme EALET, Anne (CNRS)

ID de Contribution: 2

Type: **Non spécifié**

Search for Vector-like $T'(->tH)$ in hadronic final states using Neural Networks

mardi 25 avril 2023 10:30 (30 minutes)

The presence of Vector-Like Quarks (VLQ) is introduced as one of the candidates for extending physics beyond the standard model explaining the hierarchy problem. Search for VLQ will provide valuable input for evaluating many underlying models that explain the stabilization of the Higgs boson mass, offering a potential solution to the hierarchy problem, and so on. A dedicated analysis for the search of single produced VLQ, T' was performed with the data collected in 2016 and found an excess for T' Mass at 680 GeV over the background-only hypothesis in the full hadronic final state. In this study, we present the ongoing analysis on the search for single produced T' decaying into top and Higgs in the full hadronic final state increasing the sensitivity using neural network with the full Run2 data and potentially gaining significance by extending it into Run 3 analysis.

Orateur: CHOI, Jieun

ID de Contribution: 3

Type: **Non spécifié**

Search for a single-produced Vector-Like Quark T' decaying into a top quark and a Higgs boson in the dileptonic same sign final state for the full Run 2 data with the CMS experiment

mardi 25 avril 2023 11:00 (30 minutes)

One of the most challenging problems of the Standard Model (SM) is the mass of the Higgs boson that diverges by taking the loop contributions into account. The decay of new particles like Vector-Like Quarks (VLQs) could be an interesting explanation as the final state in SM particles is well understood. We will present here the decay of a VLQ T' into a quark top and a Higgs boson in a dileptonic same sign final state for the full Run 2 data. This new analysis that has never been done before is performed thanks to the CMS detector at LHC.

Orateur: BLANCON, Benjamin (IP2I Lyon)

ID de Contribution: 4

Type: **Non spécifié**

Systematic investigations for the presence of quark matter in neutron star cores

mardi 25 avril 2023 11:30 (30 minutes)

The nature of the fundamental degrees of freedom of the strong interaction at suprasaturation densities, reachable in the core of massive compact stars, is the subject of a large debate. While ab initio nuclear physics calculations provide substantial constraints on the equation of state at low densities, the presence of deconfined quark matter at larger densities, as hinted by perturbative QCD, remains a widely considered hypothesis. In this context, it is important to set limits on the properties of an hypothetical phase transition as well as on the size and characteristics of a possible quark core in these objects. The past decade has also witnessed a drastic improvement in the detection of compact stars, with notably the first observation of a binary neutron star merger with gravitational mergers in August 2017 or the X-ray observations of the NICER mission since 2017. These observations provide promising data in order to constrain the equation of state of dense matter and decide on the occurrence of a phase transition. In this talk, I will discuss different frameworks that have been suggested to describe quark matter and the deconfinement phase transition and examine the potential of the recent astrophysical observations in bringing constraints to the hybrid star hypothesis.

Orateur: PFAFF, Antoine (IP2I)

ID de Contribution: 5

Type: **Non spécifié**

Charged-particle pseudorapidity density in proton-proton collisions in ALICE Run 3 using MFT

mardi 25 avril 2023 14:30 (30 minutes)

Charged-particle pseudorapidity density measurements help to understand the particle production mechanisms in high-energy hadronic collisions, from proton-proton to heavy-ion systems. Performing such measurements at forward rapidity, in particular, allows one to access the details of the phenomena associated with particle production close to the fragmentation region of the colliding nuclei. In ALICE, these measurements are performed in the LHC Run-3 exploiting the Muon Forward Tracker (MFT), a newly installed detector extending the inner tracking pseudorapidity coverage of ALICE in the range $-3.6 < \eta < -2.5$. The performance of the ALICE MFT will be presented for the pilot beam data taking of October 2021 for proton-proton collisions at $\sqrt{s}=900$ GeV, together with a preliminary MFT result for the charged-particle pseudorapidity density.

Orateur: HERRMANN, Sarah (IP2I Lyon)

ID de Contribution: 6

Type: **Non spécifié**

Dark-Sirens : How to explore the cosmology with gravitational waves

mardi 25 avril 2023 15:00 (30 minutes)

The LIGO-Virgo-Kagra (LVK) collaboration has detected 90 gravitational-wave (GW) events since September 2015, over three observing runs. These GW events can be used to infer the cosmological parameters of our Universe and peculiarly the Hubble constant H_0 . The Hubble constant is constrained using the luminosity distance estimated from each GW signals of compact binary coalescence, combined with an estimation of their corresponding redshift. The redshift is obtained via two approaches : The first method uses galaxy catalog information and the second one investigates the mass-redshift degeneracy. By breaking this degeneracy, the cosmological parameters are inferred jointly along with the population of binary black hole systems. When combined with the binary neutron star event GW170817, the Hubble constant was estimated at $H_0 = 68^{(+12)}_{(-8)}$ km.s⁻¹-Mpc⁻¹ (68% CL) during the 3rd observing run.

This work presents the method that has been developed to perform such analysis, as well as the inclusion of binary black hole spin models, that could help constraining the cosmology. Moreover, I will also expose my new project, related to the induced bias in the Hubble constant in presence of a realistic population of binary black hole.

Orateur: PIERRA, Grégoire (CNRS Ip2i Ondes gravitationnelles)

PhD Day 1

/ Rapport sur les contributions

TBA

ID de Contribution: 7

Type: **Non spécifié**

TBA

Orateur: GREENBERG, Christopher

ID de Contribution: 8

Type: **Non spécifié**

Améliorer la visibilité de ses publications : créer et mettre à jour son ORCID iD

mardi 25 avril 2023 15:30 (30 minutes)

Les identifiants chercheurs, et particulièrement l'ORCID ID, vous permettent d'améliorer votre visibilité et de susciter des partenariats avec d'autres chercheurs grâce à un profil en ligne que vous allez pouvoir gérer vous-même et alimenter automatiquement. Cet identifiant unique et non ambigu vous suivra tout au long de votre carrière et rassemblera tous vos travaux et contributions.

Orateurs: CRUGUEL, Amanda; DUBERNARD, Helene

ID de Contribution: **9**

Type: **Non spécifié**

Café

mardi 25 avril 2023 09:30 (30 minutes)