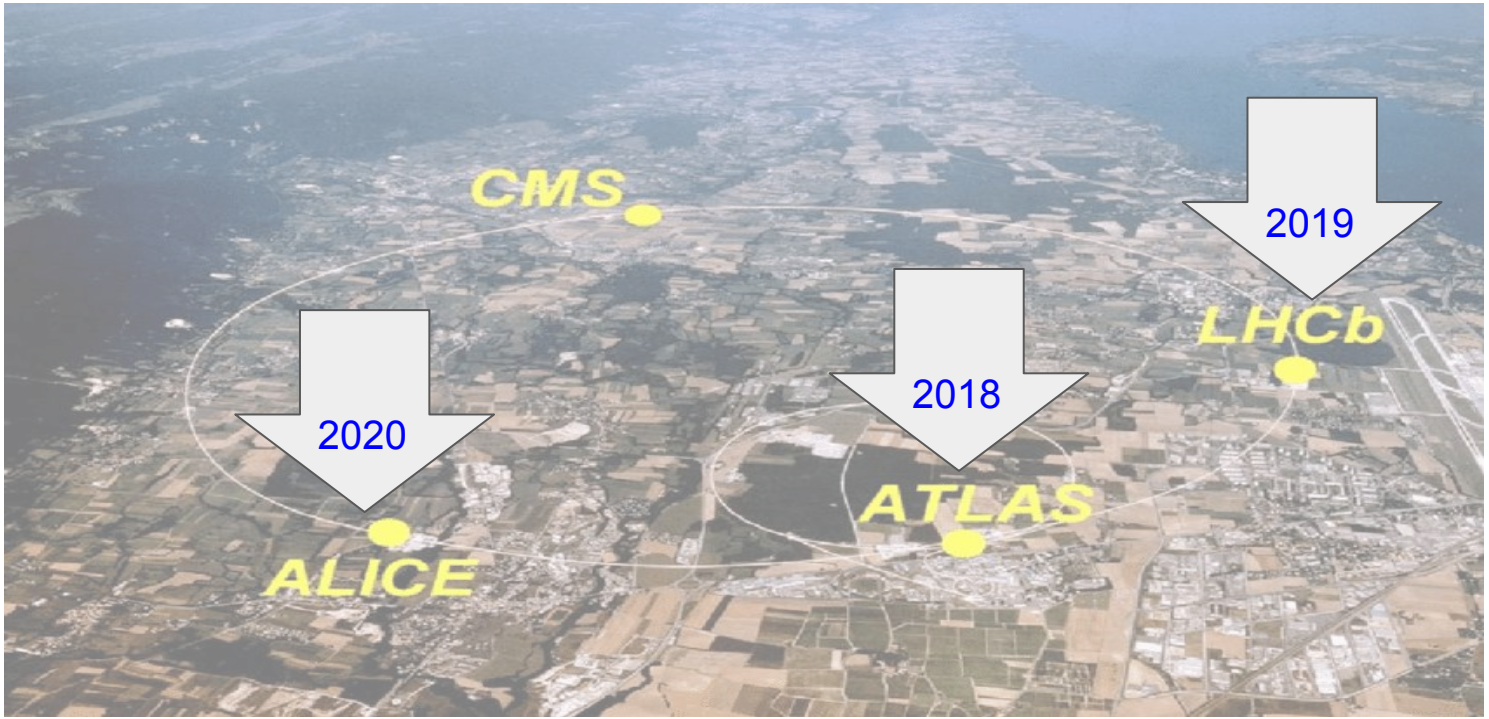
A journey through the LHC experiments at CERN

By :Theraa Tork



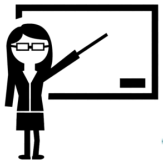
Hi !

I'm Theraa TORK

2nd year PhD student

Studying particle physics

B.C :
Physics -
electronics



High school/
ministry of
education

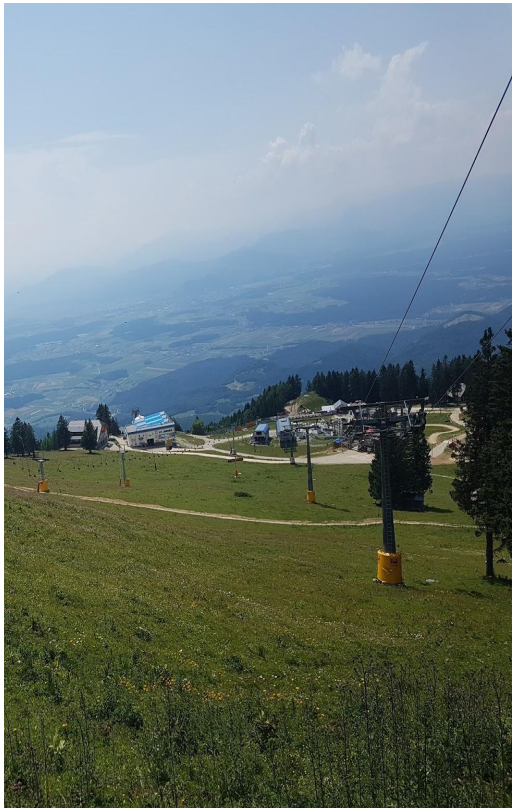
M.S
Physics

WISHEPP
2016

جامعة النجاح الوطنية - نابلس

فلسطين
وزارة التربية والتعليم العالي

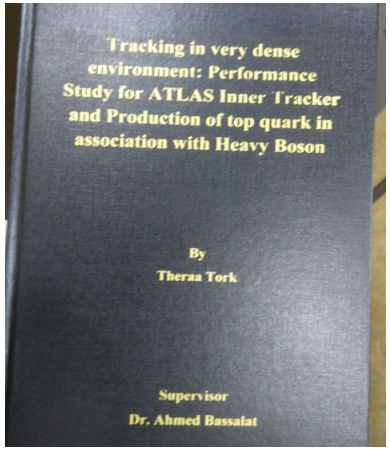
Summer School at Slovenia 2017



High energy physics school organised by IJCLab

Tracking performance of ATLAS inner tracker

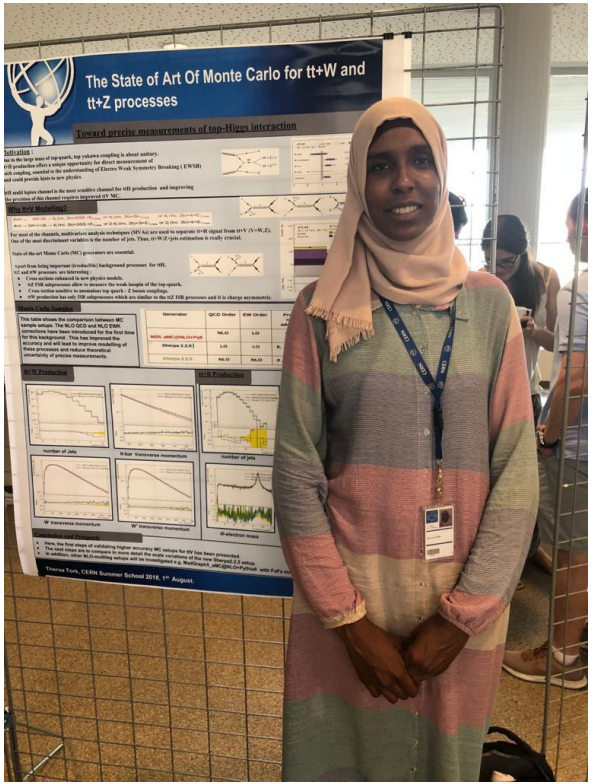
LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE



Supervised by Dr. Ahmed Bassalat (NNU)
and Dr. David Rousseau (LAL)

ATLAS EXPERIMENT

CERN summer school 2018



Internship with ATLAS experiment
Simulating tt+Z and tt+W, one of the main background of the higgs boson

LHCb internship 2019

AGENCE ERASMUS+ FRANCE · EDUCATION & FORMATION

AngularStudyToys.C | SignalToys.C | Bd2eeKstarFullFit.C | FitAngAccept.C | rf801_mcstudy.C

Theraa_stage ▸ macrows ▸ Bd2eeKstarFullFit.C

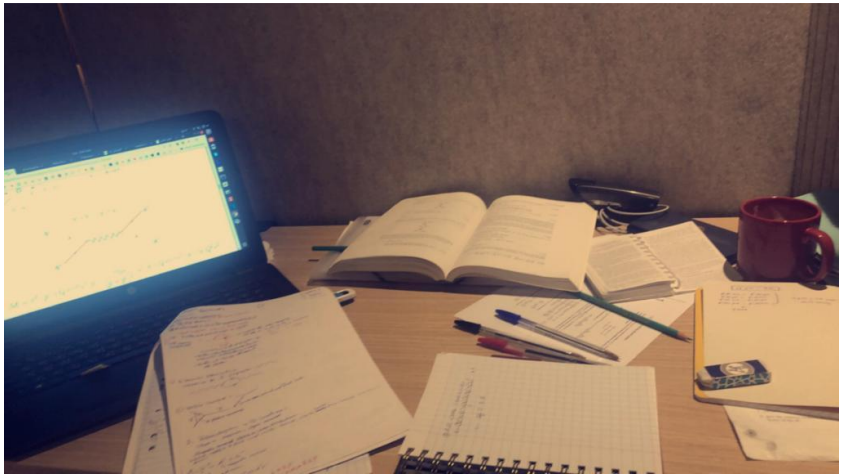
```
68  //------------------------------------------------------------------------
69  void Bd2eeKstarFullFit() {
70
71    gROOT->ProcessLine(".x lhcbstyle.C");
72
73  // The defintion of the applied cuts
74    TString L0L = "(E1_L0ElectronDecision_TOS == 1 || E2_L0ElectronDecision_TOS == 1)";
75    TString B0Mass  = "4800 < B0_DTF_PV_M && B0_DTF_PV_M< 5400" ;
76    TString q2_Low ="JPs_M < 10";
77
78    TString q2_EE_M =" 1000 < JPs_M && JPs_M < 6000";
79
80
81
82
83    //Read variables : observables
84
85    RooRealVar* B0_M = new RooRealVar("B0_DTF_PV_M", "m(e^{+}e^{-}K^{*0})", 4800., 5400., "MeV/c^
86    RooRealVar* cosThetaK = new RooRealVar("cosThetaK","cos(#Theta_{K})",-1.,1.) ;
87
88    // fill the dataset
89    //Pick up the tree
90    TChain *tree = new TChain("noq2noPk_DT");
91    tree->Add("/home/theraa/LAL/Theraa_stage/RootFiles/Bd2KstEE_CL_R1.root") ;
92    RooDataSet dataSetFinal("dataSetFinal","dataSetFinal",RooArgSet(*B0_M,*cosThetaK),Import(*tree
93
94    RooDataSet dataSetComb("dataSetComb","dataSetComb",RooArgSet(*cosThetaK),Import(*tree),CutRang
95
96    //Create the pdf
97    // ------------------------------------------------------------------------
98    // Signal PDF ; Needs angular efficiency
99    // parameters for the angular efficiencies
```

master ⊗0 ⚠0

Data analysis with LHCb experiment

LHCb

Master 2: NPAC Nuclear, particle , Astroparticle and Cosmology



Supervised by:
Zaida Conessa and Christophe suire.

Now : PhD !

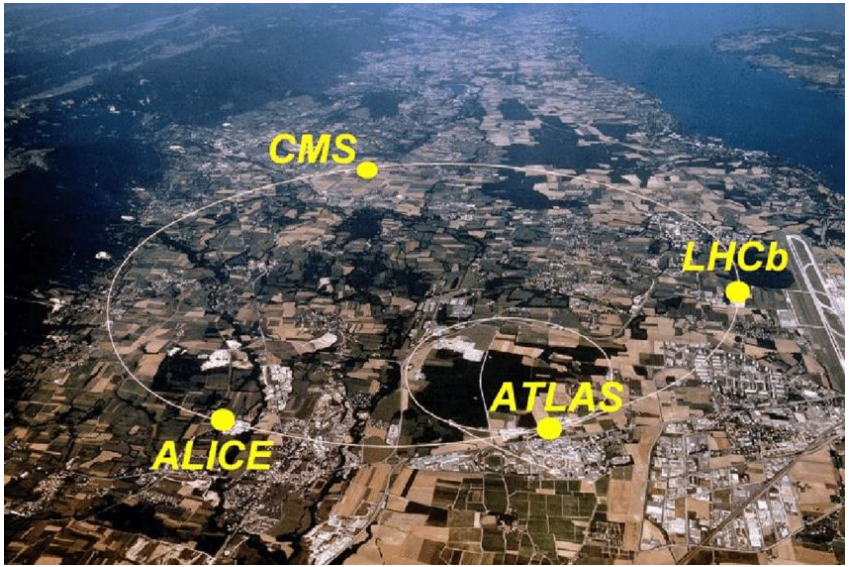
Mesure de la production de double charme avec ALICE auprès du LHC
par Theraa Tork

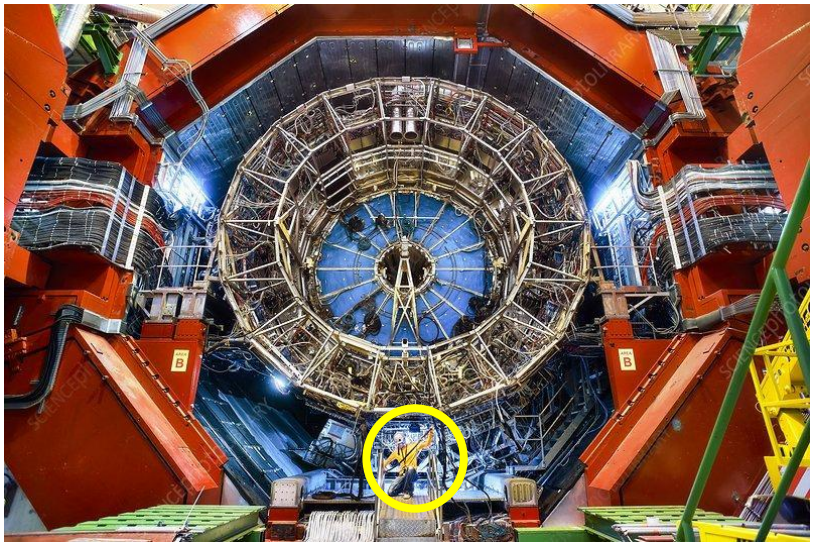
Projet de thèse en Physique hadronique

Sous la direction de Zaida Conesa del valle et de Christophe Suire.

Thèses en préparation à université Paris-Saclay , dans le cadre de École doctorale Particules, Hadrons, Énergie et Noyau : Instrumentation, Imagerie, Cosmos et Simulat , en partenariat avec Laboratoire de Physique des deux Infinis Irène Joliot-Curie (laboratoire) et de Faculté des sciences d'Orsay (référent) depuis le 01-10-2020 .

ALICE: a large ion collider experiment



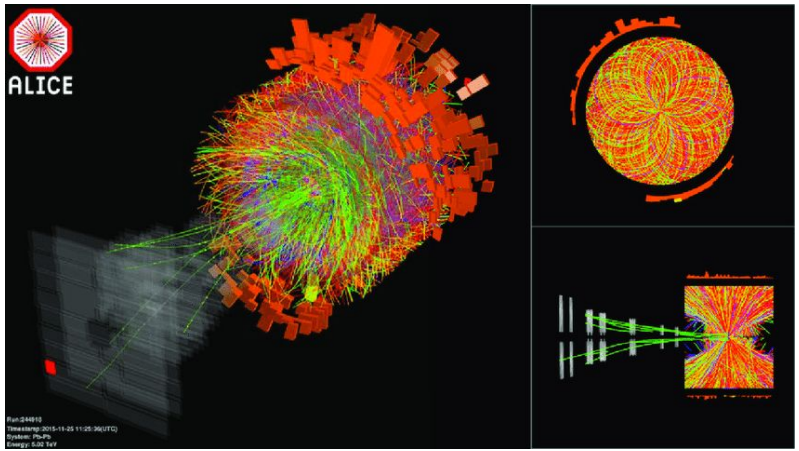


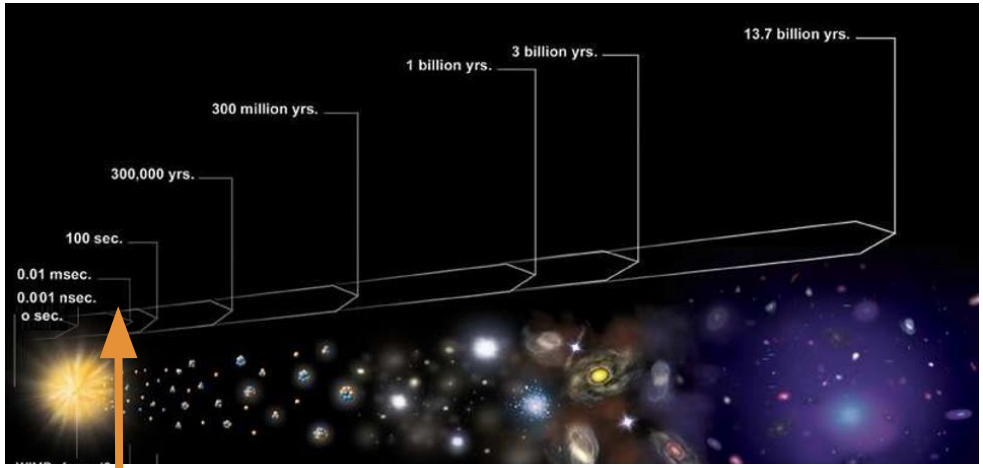
Accelerating particles up to the speed of light

10 m height * 10m width * 26 m Length

What do we do @ ALICE

ALICE is a big machine that study the conditions of the universe after 10^{-6} s of the big bang.





Collision → Trigger → Offline reconstruction → Selection → Analysis → Documentation

Published a paper !

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

CERN-EP-2022-064
24 March 2022

Measurement of $\psi(2S)$ production as a function of charged-particle pseudorapidity density in pp collisions at $\sqrt{s} = 13$ TeV and p–Pb collisions at $\sqrt{s_{NN}} = 8.16$ TeV with ALICE at the LHC

ALICE Collaboration

Abstract

Charmonium production in pp collisions at center-of-mass energy of $\sqrt{s} = 13$ TeV and p–Pb collisions at center-of-mass energy per nucleon pair of $\sqrt{s_{NN}} = 8.16$ TeV is studied as a function of charged-particle pseudorapidity density with ALICE. Ground and excited charmonium states (J/ψ, $\psi(2S)$) are measured from their dimuon decays in the interval of rapidity in the center-of-mass frame $2.5 < y_{cms} < 4.0$ for pp collisions, and $2.03 < y_{cms} < 3.53$ and $-4.46 < y_{cms} < -2.96$ for p–Pb collisions. The charged-particle pseudorapidity density is measured around midrapidity ($|\eta| < 1.0$). In pp collisions, the measured charged-particle multiplicity extends to about six times the average value, while in p–Pb collisions at forward (backward) rapidity a multiplicity corresponding to about three (four) times the average is reached. The $\psi(2S)$ yield increases with the charged-particle pseudorapidity density. The ratio of $\psi(2S)$ over J/ψ yield does not show a significant multiplicity dependence in either colliding system, suggesting a similar behavior of J/ψ and $\psi(2S)$ yields with respect to charged-particle pseudorapidity density. The results are also compared with model calculations.

Other tasks

Not only study !

Supervising a student : Qassem

Babysitting the detectors

Data Analysis

Seminars and Presentation