

Eduardo Velasquez

Brief CV

Birth Medellín, Colombia — 8 September, 1994
Nationality Colombian
Phone +33 7 67 99 33 72
Email edvelasquezal7@gmail.com

EDUCATION

Master 1 and 2 - Fundamental Physics

2020 - Present

Aix-Marseille Université, France.

Orientation: Theoretical Physics and Elementary Particle Physics.

Undergraduate Physics

2013 - 2018

Universidad Nacional de Colombia, Sede Medellín, Colombia.

Thesis: “Mathematical and physical foundations of LQG”.

Advisor: Luis Alberto Sánchez Duque.

Duration: July 2017 to July 2018.

PROJECT SUMMARY

Spacetime models from the electromagnetic field

2022

Scientific Watch 3 - Supervisor: Serge Lazzarini

Effective dynamics for quantum black holes

2021

M1 internship - Supervisor: Simone Speziale

Singularities in Black Holes

2021

Scientific Watch 2 - Supervisor: Lautaro Amadei

A survey on Quantum Cosmology

2020

Scientific Watch 1 - Supervisor: Lautaro Amadei

Computation of expectation values of geometrical operators

2018

Undergraduate internship - Supervisor: Carlo Rovelli

SKILLS

Languages Spanish (mother tongue), English (fluent), French (medium)

Programming Software L^AT_EX, PYTHON, MATHEMATICA, MATLAB, FORTRAN, COMSOL.

Others Guitar, Kung Fu

14 February 2022

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Centre de Physique Théorique
Campus de Luminy
163 Av. de Luminy
Marseille, France, 13009

Dear CPT director,

I am writing this letter of motivation as part of the internship recruitment protocol at the *Centre de Physique Théorique* (CPT). I have the honor of being accepted by the professor and researcher of the CPT Particle Physics group, Aoife Bharucha, to work under her supervision in the internship that is part of the Master 2 program at *Aix-Marseille Université* (AMU).

During my undergraduate internship and then during my first year of master's degree, my focus as a physicist was along the path of theoretical physics of Gravity and, at times, of Quantum Gravity. However, during my master's degree, I broadened my interest in theoretical physics and discovered a great passion and talent for Particle Physics. After having enjoyed the courses taught by AMU and obtained excellent results, I decided to apply for the Master 2 internship to work with the members of the Particle Physics group of the CPT. Professor Bharucha is proposing to me two research topics to follow, one related to Radiative Decays and the other to Dark Matter.

Between the two proposals, I decided to choose the project called "Radiative leptonic D decays". Although it is also of great interest to me to study Dark Matter, I decided to choose this project due to my deep desire as a theoretical physicist to work hand in hand with experimental physicists, so that I can build theoretical models that can be easily verified by them in the experiments, and thus be able to open doors towards new physics.

I hope that my request is well received and I am willing to be contacted to resolve any type of concern or question that may arise.

Sincerely yours,



Eduardo Velasquez

NOTES ET RÉSULTATS

UNIVERSITE D'AIX-MARSEILLE

EDUARDO VELASQUEZ

Dossier : 20030332

Année : 2020/2021

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ÉLÉMENTS & ÉPREUVES

Code	Libellé	Rang	ECTS	Session 1	Résultat	Session 2	Résultat
SPH4AT	M1 Physique		60	14.77/20	ADM		
SPHASATC	Semestre 1 Master 1 Physique		30	14.797/20	ADM		
SPHAU01C	Veille scientifique et technologique 2		2	15.5/20	ADM		
SPHAU02C	Méthodes numériques et travaux pratiques		4	17.5/20	ADM		
SPHAU03C	Physique statistique/ Statistical Physics		6	13/20	ADM		
SPHAU04C	Mécanique quantique/Quantum Mechanics		6	17.6/20	ADM		
SPHAU05C	Mathématique pour la physique / Mathematics for Physics		4	12/20	ADM		
SPHAU06C	Électromag. et optique / Electromagnetism and Optics		4	9.66/20	ADC		
SPHAU09C	Français 2		2	19/20	ADM		
SBOA	Bonus semestre A			0/20			
SBOAN0	Sans Bonus			0/20			
SPHBSATC	Semestre 2 Master 1 Physique		30	14.743/20	ADM		
SPHBUA6C	Professionalisation 3		2	12/20	ADM		
SPHBA6DC	Professional course			12/20			
SPHBU01C	Méthodes numériques et travaux pratiques		4	12.5/20	ADM		
SPHBU02C	Stage M1 (1,5 mois)		4	15.67/20	ADM		
SPHBU08C	Cosmologie		4	17.1/20	ADM		
SPHBU09C	Relativité		4	18/20	ADM		
SPHBU45C	Physique des particules, physique subatomique		4	13.3/20	ADM		
SPHBU78C	Méthodes mathématiques avancées		4	11.5/20	ADM		
SPHBU84C	Français 2 et veille scientifique et technologique		4	16.5/20	ADM		
SPHB84AC	Français 3			18/20			
SPHB83BC	Veille scientifique et technologique 3			15/20			
SBOB	Bonus semestre B			0/20			
SBOBN0	Sans Bonus			0/20			

INFORMATIONS

Signification des codes résultats :
ADC : Admis/comp. ADM : Admis

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Code	Libellé	Rang	ECTS	Session 1	Résultat	Session 2	Résultat
SPHCSABC	Semestre 3 M2 Physique : Physique (Relevé 1partiel)						
SPHCX01C	PTP Choix S3 (18 crédits)			DEF			
SPHCU07C	Quantum Field Theory			ABJ	AJ		
SPHCU08C	Advanced Particle Physics	2/13	6	16.95/20	ADM		
SPHCU09C	General Relativity	7/20	6	12/20	ADM		

INFORMATIONS

Signification des codes résultats :

DEF : Défaillant ABJ : Absence justifiée ADM : Admis

Master2 Internship proposal at CPT

Research team:

Particle Theory

Supervisor:

Aoife Bharucha

e-mail:

aoife.bharucha@cpt.univ-mrs.fr

Project title:

Radiative leptonic D decays

Description:

B and D meson decays are the focus of the LHCb experiment at CERN, and are important indirect probes of physics beyond the Standard Model. In order to increase the sensitivity of these modes, the hadronic structure must be well understood. Radiative leptonic decays and decays to four leptons are a sensitive way to probe this hadronic structure. The aim of the 4-month internship is to adapt existing calculations for B decays to the case of the D meson, which has so far never been done. This would naturally lead to a PhD thesis.

References:

- Radiative leptonic decay $B \rightarrow \gamma \ell \nu_\ell$ with subleading power corrections, M. Beneke, V. M. Braun, Y. Ji and Y. B. Wei, JHEP **07** (2018), 154 [arXiv:1804.04962 [hep-ph]].
- B meson distribution amplitude from $B \rightarrow \gamma l \nu$, M. Beneke and J. Rohrwild, Eur. Phys. J. C **71** (2011), 1818 [arXiv:1110.3228 [hep-ph]].