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Career Objectives

Starting from October of 2018, I am looking to work in Japan in an intellectually stimulating environment in which by solving interesting-challenging problems I will contribute to the company and it will have a real-world impact.

Summary

I am a physicist with both experience in theoretical and experimental particle physics. Through my studies in physics, I learned how to construct logical arguments to solve complex problems in an analytical approach, by elaborating mathematical-numerical models after understanding in a short amount of time a large quantity of information. I also developed a critical way of thinking that allows me to draw conclusion from my work and that of others, by making unbiased judgments about the quality of information. In addition I developed programming skills in: Mathematica (high), C++ (intermedia) and Root (beginner), among text edition skills in Microsoft Office: Word, Excel and Power Point and LaTeX from simple documents to complex scientific publications. Furthermore I can fluently speak Spanish and English, Japanese at business level and Italian at beginner level.

Work attitude

Doing part of my undergraduate studies and the entire graduate course in a country different from the one I was born, made me a person able to adapt many different scenarios. I consider myself as an ambitious and diligent person since I always focused on getting the best scores on a test. I choose physics as my major due to my innate curiosity, inquisitive personality and for always paying attention to small details. In a work environment I consider that I am a responsible, organized and punctual person that always finish a task on time due to good time management skills. I am an open minded person that takes well based constructive criticism well and I value integrity and honesty in a person

Awards/Scholarships

From 10/2013-09/2018: Scholarship from the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT, scholarship No. 133058)

Work History

2015/04-present: Student Learning Adviser at Tohoku University (English Adviser)

2016/04-2016/08: Teaching Assistant at Tohoku University (Under Graduated Physics Course)

2015/04-2015/08: Teaching Assistant at Tohoku University (Under Graduated Physics Course)

Past Research summary

- 1) **Ph.D.:** Research area: Relativistic Quantum Information, an emergent interdisciplinary field which tries to merge Quantum Information Theory with Quantum Field Theory in Curved Space-times. We showed by theoretical calculations that stationary black holes carry non vanishing supertranslation charge by obtaining a general formula of gravitational charges. This is contrary to the results of Hawking et al, a result that might help to solve the information loss problem.
 - 2) **Master:** Thesis Title: “Informational Resource for Quantum Energy Teleportation” QET is a quantum task in which energy is transported in an operational meaning, without the transfer of energy carriers. I performed analytical and numerical optimization using Mathematica of a multiple variable and complicated expression to calculate: the maximum teleported energy and the quantum correlations in a three spin Ising chain. I found that there are cases in which even though there are quantum correlations between the edge-spins it is impossible to teleport energy. This is an unexpected result that can help to understand one of the most fundamental issues of quantum information such as the relation between information and energy.
 - 3) **Bachelor:** Thesis Title: “Study of CCD sensors as Particle Detectors for the ILC”. I measured: the dark current, signal to noise ratio and charge transfer inefficiency in a prototype of fine pixel charged coupled device for the future International Linear Collider. To do so, I developed a program in C++/Root that allowed to classify the set of data by number of particle tracks in each measurement. The results showed that, under similar operating conditions as in the ILC, the prototype does not experience dark current effects and the charge transfer efficiency was 97%, greater than the minimal operating threshold of 90 %.
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Education

2015/10-present: Tohoku University, Graduate School of Science, Doctor Course in Physics, Research Lab: Particle Theory and Cosmology Group

2013/10-2015/09: Tohoku University, Graduate School of Science, Master Course in Physics, Research Lab: Particle Theory and Cosmology Group

2011/10-2012/09: Tohoku University, JYPE program (Exchange Student), Research Lab: Experimental Particle Physics Group (Accelerator)

2008/09-2013/09: Simon Bolivar University, Bachelor in Physics, Cum Laude, **GPA: 4.68/5.00**

2006/09-2008/09: Simon Bolivar University, Electronic Engineering (changed major)

Certificates

PGRE (Physics Graduate Record Examination) 10/13/2012, **Score: 800/990 (74 percentile rank)**

GRE (Graduate Record Examination) 11/26/2012, **Verbal 153/170, Quantitative: 158/170**

Language Skills

Spanish: native language

English: TOEFL-IBT 11/17/2012, **Score: 98/120** (Reading 27, Listening 27, Speaking 20, Writing 24)

Japanese: JLPT 12/07/2014, **Level: N2, Score 90/180**, Vocabulary-Grammar 19/60, Reading: 27/60, Listening: 44/60

Italian: 5 year Course (2001-2006) of Italian Language and General Italian Culture

Extra-Curricular Activities

2017/09/11-2017/09/15: Internship at IBM Japan; consisted in a one day experience in software development by using Agile methodology and a two days Hackathon to create a smartphone application.

2016/05-2017/02: Program in Emergent Innovation; a series of seminar/workshop (mostly in Japanese) to increase: innovation, management and communication skills.

2016/10-2017/01: I performed a "Big Data Analysis" of Tohoku University main library data, as a Project Based Learning of the Program in Emergent Innovation of the same university.

2013/04-2013/07: Teaching to elementary school students about risk prevention in case of earthquakes and mudslides by organizing emergency drills with the school authorities.

List of Publications

- 1) M. Hotta, J. Trevison and K. Yamaguchi, "Gravitational Memory Charges of Supertranslation and Superrotation on Rindler Horizons ", Phys. Rev. D 94, 083001 (2016)
- 2) J. Trevison and M. Hotta, "Quantum energy teleportation across a three-spin Ising chain in a Gibbs state", J. Phys. A: Math. Theor, 48 (2015)
- 3) E. Kato, H. Sato, H. Ikeda, Y. Sugimoto, A. Ishikawa, K. Itagaki, J. Trevison, Y. Takubo and H. Yamamoto, "Development of readout ASIC for FPCCD vertex detector at the ILC", IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) (2012)