

VICTOR B. VALERA

Curriculum Vitae

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EDUCATION

- Postgraduate Diploma Programme** August 2019 - August 2020 (expected)
High Energy, Cosmology and Astroparticle Physics.
International Centre for Theoretical Physics (ICTP) - Italy
- Bachelor of Science in Physics** February 2014 - December 2018
Department of Science. National University of Engineering, Peru
Current mark: 14.992 - Equivalent GPA: 4.00
- Exchange Student** August 2017 - December 2017
Faculty of Science. National Autonomous University of Mexico (UNAM)

RESEARCH EXPERIENCE

- Simulation of the PICO 500 experiment**
Advisor: Dr. Carsten Krauss. January 2019 - March 2019
University of Alberta - Department of Physics.
I worked over the built of the Geant4 simulation of the PICO500 experiment to study the contribution of radiogenic neutrons to the experimental background. PICO500 is an experiment that aims to probe Dark Matter spin-dependent interactions using a bubble chamber at SNOLAB.
- Study of the effects on the neutrino dispersion relation by an interaction with a scalar Dark Matter thermal background**
Advisor: Dr. Juan Carlos D'Olivo. September 2017 - Present
National Autonomous University of Mexico - Institute of Nuclear Sciences **Thesis Project**
I used the Finite Temperature Field Theory to explore an interaction between neutrinos and a thermal Dark Matter background represented by a scalar boson, and its possible contribution to the neutrino self-energy and hence on its dispersion relation.
- Calibration of the Cherenkov detector array for the LAGO collaboration**
Advisor: Dr. Cesar Castromonte. August 2018 - December 2018
Peruvian National Commission for Aerospace Research and Development - Department of Astrophysics.
Development of a semi-analytic method that allows us to improve the calculation of the deposited charge in a Water Cherenkov Detector by vertical muon events. The method was used to callibrate a Cherenkov tank deployed at the Antarctica and the results presented at the International Cosmic Ray Conference 2019.
- Photomultiplier Calibration for the Precision Oscillation and Spectrum Experiment (PROSPECT)**
Advisor: Ph. D. Karsten Heeger. January 2017 - April 2017
Yale University - Wright Laboratory, PROSPECT Collaboration.
I characterized photomultiplier tubes for the antineutrino detector of the PROSPECT experiment and contributed to the first steps in the assembly of the antineutrino detector inside a clean room. Also, I analyzed the 3+1 neutrino model as possible explanation for neutrino current anomalies.
- Analysis of the sky quality at the astronomical observatory in Huancayo using the DIMM method**
Advisor: Dr. Julio Tello. May 2016 - June 2017
Geophysical Institute of Peru - Astronomy Department
Study of the Kolmogorov turbulence model as a tool to develop a seeing measurement device for the observatory. I also developed the acquisition software (written in Python) to process the data from the observatory in order to calculate the seeing parameter at the observatory location.

Study of the behaviour of High Amplitude Delta Scuti stars

Advisor: Dr. José Peña.

January 2016 - February 2016

National Institute of Astrophysics, Optics and Electronics, Mexico

We studied the characteristic light curve and the spectrum to show the stars behavior. The data obtained during this school was used in a publication.(www.redalyc.org/pdf/571/57150515015.pdf)

AWARDS AND ACHIEVEMENTS

OPPORTUNITY FUNDS FELLOW

February 2019

Fellowship granted by the U.S. Department of State through the agency EducationUSA, to cover the expenses related to graduate school applications of outstanding students from developing countries.

AMERICAN CHEMICAL SOCIETY INITIATIVE RECOGNITION

December 2018

Journal Club Initiative "For promoting the discussion of academic journals among college students"

ALIANZA DEL PACIFICO SCHOLARSHIP, UNAM

August 2017

Full scholarship to study a semester abroad at the National Autonomous University of Mexico (UNAM)

EDUARDO DE HABICH PRIZE, UNI

July 2017

Prize awarded to the student with the highest GPA of the career during the fourth year of studies, Peru

RESEARCH EXPERIENCE FOR PERUVIAN UNDERGRADUATES

January 2017

Chosen by the RPU program for a research internship at Yale University

SUPPORT PROGRAM FOR FORMATIVE RESEARCH 2016, UNI

May 2016

Grant (S/. 30 000 Nuevos Soles) to support the research initiation of undergraduate students with high academic achievement, Peru

1st PLACE IN THE ENTRANCE EXAM FOR PHYSICS MAJORS AT UNI.

February 2014

With the entrance a full scholarship is given for the 5 years of coursework, Peru

PUBLICATIONS AND PROCEEDINGS

L. Otiniano , J. Pena , J. Vega , **V.B. Valera** and C. Castromonte. *Water Cherenkov detector optimization for space weather studies in Antarctic.* 36th International Cosmic Ray Conference - ICRC 2019 PoS(ICRC2019)1137

CONFERENCE PRESENTATIONS AND POSTERS

V. B. Valera "Estimation of the Radiogenic Background at the PICO-500 Dark Matter Experiment"

University of Alberta Research Experience Symposium

March 2019 - Poster

V. B. Valera, L. Otiniano "Calibration of the Cherenkov detectors array for the LAGO Collaboration"

Latin American Symposium of High Energy Physics

November 2018 - Poster

V. B. Valera, J. G. Benel "Implementation of a portable solar charger"

Science Fair of the Science Department of the National University of Engineering

October 2016 - Poster

V. B. Valera, J. R. Minaya. "Determination of contact times of the total lunar eclipse of September 2015"

Peruvian Meeting of Astronomy and Astrophysics 2016

February 2016 - Conference

WORKING EXPERIENCE

Teaching Assistant: Physics I (2018 I term), Advanced Physics Laboratory (2018 II term)

Vice president of the Science Faculty Students Society (2018 period)

President of the Astronomy Group of the National University of Engineering (2017 & 2018 periods)

COURSES AND WORKSHOPS

School on High Energy Astrophysics - ICTP-SAIFR, Brazil

August 2019

Park City Mathematics Institute Undergraduate Summer Session - Institute for Advance Study

July 2019

XII Latin American Symposium of High Energy Physics - PUCP. Peru	November 2018
School and Workshop on Dark Matter and Neutrino Detection - ICTP-SAIFR, Brazil	July 2018
Mini Workshop on Neutrino Physics - UNAM, Mexico	November 2017
Latin American School of Observational Astronomy - UNAM, Mexico	January 2016

SKILLS

COMPUTATIONAL	Python, Geant4, Root, C, C++, Gnuplot, AstroimageJ, Latex
EXPERIMENTAL	Particle detector experience, observational astronomy, telescope manipulation, cleanroom work, photomultiplier tubes, Arduino.
LANGUAGES	Spanish: Native, English: Advanced (TOEFL iBT = 106), Italian: Basic

EXTRACURRICULAR ACTIVITIES

Journal Clubs (Founder) - Initiative that promotes the creation of student groups with similar interests to discuss academic papers.

As the President of the Astronomy Group I helped in the organization of visits to schools to give talks and workshops for elementary school students in topics related to Astronomy.

Science Clubs 2017 (CdC-Per) Assistant at the Particle Physics Club for high school students.

Member of the Swimming Team of the Department of Science at the National University of Engineering.