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Omar Moreno

Experience

2009-present **Graduate Student Researcher**, *Santa Cruz Institute for Particle Physics*, Santa Cruz, CA

- Used frequentist statistical analysis to conduct a resonance search for a new fundamental particle, heavy photon, thought to mediate dark matter interactions.
- Developed maximum likelihood fitter to determine the parameters of a model describing Quantum Electrodynamics Trident background.
- Developed python application used to optimize the selection of radiative (signal like) events using a Random Forest classifier, boosting the signal/background fraction by 40%.
- Co-developer of both a C++ and Java object pipeline used to process and clean up over 10 TB of noisy data from the HPS Silicon Vertex Tracker (SVT) into basic physics objects used for analysis by HPS users.
- Developed Java front end used to load greater than 100,000 calibration constants to a MySQL database.

2007-2009 **Graduate Student Researcher**, *Department of Physics and Astronomy, California State University, Los Angeles*, Los Angeles, CA

- Developed C++ analysis used to optimize detector selection criteria resulting in an improved measurement of the analyzing powers of the reaction $p + CH_2 \rightarrow X$ at $Q^2 = 2.733$ GeV/c^2.
- Developed maximum likelihood fitter to determine the parameters of a model describing the polarization of the proton.
- Measured the form factor ratio, G_{E_p}/G_{M_p}, of the proton at a $Q^2 = 2.733$ GeV^2 using blind analysis techniques.

2005-2006 **Undergraduate Researcher**, *Department of Physics and Astronomy, University of California, Irvine*, Irvine, CA

- Developed C++ analysis to measure the branching fraction for the rare decay $B \rightarrow e^+e^-$ using blind analysis techniques.
- Used a multilayer perceptron to boost the identification of the decay $\Lambda \rightarrow p\pi^-$ by 10%.

2000-2001 **Mechanical Engineering Apprentice**, *Nasa Dryden Flight Research Center*, Edwards, CA

- Designed and constructed a device used to evaluate the skin-friction reduction of several Micro-Blowing Technique skins at supersonic speeds.

Education

(Expected) 2016 **Ph.D. in Physics**, *University of California at Santa Cruz*, Santa Cruz, CA

2007-2009 **M.Sc. in Physics**, *California State University, Los Angeles*, Los Angeles, CA

2001-2006 **B.Sc. in Applied Physics**, *University of California at Irvine*, Irvine, CA

Skills

Languages Java, C++, C, Python, MySQL, XML, Mathematica. Familiar with with HTML5 and Fortran

Tools Linux, NumPy, Matplotlib, scikit-learn, git, SVN, CMake, IPython, LaTeX, ROOT, RooFit

Awards

2012 Margaret Burbidge Award for Best Experimental Research

2009 Margaziotis Award for Best Experimental Research

2007-2009 Louis Stokes Alliance for Minority Participation Bridge to the Doctorate Fellowship

2006 California Alliance for Minority Participation Mentor of the Year

2001-2002 Chancellor's Leadership Scholar