

Sebastián Urrutia Quiroga

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Education

University of Massachusetts Amherst (UMass), Amherst, MA, USA

- PhD. in Physics (student) Set 2017 to date

Pontificia Universidad Católica de Chile (PUC), Santiago, Chile

- MSc. in Physics 2015
Thesis title: “Higgs Bosons in extensions of the Standard Model: the Inert Doublet Model case”
Advisers: Dr. Marco Aurelio Díaz (Physics Institute) and Dr. Angel Abusleme (School of Engineering)
Conferred with Maximum Distinction
- Electrical Engineer 2015
Conferred with Maximum Distinction
- Bachelor in Engineering Sciences 2013
Conferred with Distinction

Research Experience

University of Massachusetts Amherst, Amherst, MA, USA

- Research Assistant Summer 2018
Dimension $d = 9$ LNV effective operators to generate neutrino masses and $0\nu\beta\beta$ decay

Pontificia Universidad Católica de Chile, Santiago, Chile

- Research Assistant Oct 2015 to Aug 2017
Development of phenomenological studies Beyond Standard Model for Run 2 and Run 3 of the LHC and Linear Colliders by using event generators and simulations
- Master's Student Aug 2013 to Sept 2015
Theoretical and phenomenological studies of the Inert Doublet Model, a simple extension of the Standard Model, focused on its performance as a particle physics model as well as a dark matter model
- Research Assistant Mar 2014 to Aug 2014
One-semester practice work focused on an introduction to group theory and its implications in particle physics
- Undergraduate Student Jul 2011 to Dec 2011
One-semester practice work focused on condensed matter physics and magnetic materials, specifically a numerical study of the Landau-Lifshitz-Gilbert equation

Teaching Experience

University of Massachusetts Amherst, Amherst, MA, USA

- Department of Physics Aug 2017 to date
Teaching Assistant for Introduction to Physics for Life Sciences majors

Pontificia Universidad Católica de Chile, Santiago, Chile

- Departments of Physics and Mathematics, and School of Engineering Aug 2010 to Jul 2017
Instructor and Teaching Assistant for Statics and Dynamics, Thermodynamics, Electricity and Magnetism, Mathematical Methods for physics, Single variable differential and integral calculus, Multivariable differential and integral calculus, Ordinary differential equations, Electronics, Electrical Materials, Electrical Circuits and other courses for Science-related majors

- Support Center for Academic Performance and Vocational Exploration (CARA UC) Mar 2010 to present
Academic Mentor for students in math and physics courses for science-related majors
- Educational Program for Academically Talented Children (Penta UC) Aug 2009 to Jul 2014
Teacher and Teaching Assistant for courses aimed at teaching high school students classical mechanics, fluid physics and special relativity

Primary Research Interests, Schools and Publications

- High Energy Physics, Particle Physics, Beyond Standard Model Physics, Electroweak Interactions, Higgs Mechanism, Quantum Field Theory
- 4th Chilean School of High Energy Physics, Attendance as student
- M. A. Díaz, B. Koch and **S. Urrutia-Quiroga**, “Constraints to Dark Matter from Inert Higgs Doublet Model”, *Advances in High Energy Physics* 2016 (2016) 8278375. arXiv:1511.04429 [hep-ph]
- M. A. Díaz, N. Rojas, **S. Urrutia-Quiroga** and J. F. W. Valle, “Production at Colliders of a Heavy Higgs in the Singlet-Triplet Scotogenic Dark Matter Model”. arXiv:1612.06569 [hep-ph]

Scholarships and Academic awards

- National Commission for Scientific and Technological Research (CONICYT), Santiago, Chile 2018
Scholarship to support PhD. students out of the country (partial funding)
- Institute of Engineers of Chile, Santiago, Chile 2016
“Marcos Orrego Puelma” Prize as one of the best students graduated in traditional universities in 2016
- Fulbright Program, USA 2016
Fulbright Grantee from Chile (home country)
- School of Engineering, PUC, Santiago, Chile 2015
Distinguished as the best student in the 2015 class. Distinguished as the best student of the Electrical Engineering Department
- National Commission for Scientific and Technological Research (CONICYT), Santiago, Chile 2014 to 2015
Scholarship to support MSc. students in Chile (full funding)
- Pontificia Universidad Católica de Chile, Santiago, Chile 2009-2014
“Padre Hurtado” Prize. Full funding to carry out undergraduate studies at the university
- Ministry of Education, Government of Chile, Santiago, Chile 2009-2014
Partial funding to carry out undergraduate studies at a Chilean university
- Honorable Council of Rectors of Chilean Universities, Santiago, Chile 2008
Award conferred by obtaining one of the highest national scores in the application process to college

Other awards

- School of Engineering, PUC, Santiago, Chile 2018
Most inspiring teacher assistant. Award conferred by the Engineering Student Association
- Department of Mathematics, PUC, Santiago, Chile 2011, 2014, 2015
A-class teacher assistant, highest category in the Department
- La Salle Institute High School, Santiago, Chile 2008
Award conferred to represent the spirit of the institution

Volunteer Activities

- Third High Energy Festival, Physics Institute, PUC, Santiago, Chile 2015
Member of the organizing committee. Activity focused on explaining current investigations to undergraduate students
- International Masterclass-Chile, Physics Institute, PUC, Santiago, Chile 2015, 2016
Member of the organizing committee. Activity focused on teaching some basics principles of particle physics to high school students
- Talent + Inclusion Program, School of Engineering, PUC, Santiago, Chile 2014-2015
Tutor for program students with social and economic problems, in order to help them in their first year
- School of Engineering, PUC, Santiago, Chile 2014
Student Representative of the Electrical Department, Students Association of the School of Engineering
- La Salle Institute High School, Santiago, Chile 2007-2008
Vice-president, Students Association of the La Salle Institute High School
- La Salle Institute High School, Santiago, Chile 2006-2008
Member of the debate competitive team of the La Salle Institute High School