

María Isabel Pedraza Morales

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1 Curriculum Vitae

1.1 Professional Experience

Dates	Name of Organization	Job Title
2013–Present	Benemérita Universidad Autónoma de Puebla, Mexico.	Associate Professor (Tenure) Researcher SNI I
2012–2013	Benemérita Universidad Autónoma de Puebla, Mexico.	Postdoctoral Research Fellow
2010–2012	University of Wisconsin–Madison.	Postdoctoral Research Fellow
2007–2009	University of Wisconsin–Madison.	Research Assistant
2004–2006	Universidad del Valle de México	Part–time Lecturer (6h/w)
2004–2005	Instituto de Física, Benemérita Universidad Autónoma de Puebla, Mexico.	Part–time Lecturer (6h/w)

1.2 Education

- December 16th, 2009 **Ph.D. Ad Honorem**
Thesis : Beyond the Standard Model Effects and the Possibility to be Observed with the Pierre Auger Observatory.
Institution : Instituto de Física,
Benemérita Universidad Autónoma de Puebla, Mexico.
Supervisors : Dr. Humberto Salazar Ibargüen & Dr. Alfonso Rosado Sánchez
- November 21st, 2005 **M.Sc. Physics**
Thesis: Operator Algebra and the Airy-Volkov Functions.
Institution : Instituto de Física,
Benemérita Universidad Autónoma de Puebla, Mexico.
Supervisors : Dr. Alejandro Palma Almendra
- February 14th, 2003 **B.A. Physics**
Thesis: Design and Performance of a High Mountain Fluorescence Detector.
Institution : Facultad de Ciencias Físico-Matemáticas
Benemérita Universidad Autónoma de Puebla, Mexico.
Supervisors : Dr. Humberto Salazar Ibargüen

1.3 Teaching

- 2013–Presente: **Full time Professor and Researcher A at Facultad de Ciencias Físico-Matemáticas, Benemérita Universidad Autónoma de Puebla, Mexico.**
Undergraduate Courses : Superior Algebra, Modern Physics, Analytical Geometry, Analytical Geometry with Vectors, Computational Physics I, Computational Physics II, Computational Physics
Master Level Courses : Particle Interaction with Matter.
Doctoral Level Courses : Particle Interaction with Matter, Thesis Seminar (I to V), Standar Model of Electromagnetic Interaction, Research Seminar (I to V).
- 2004-2006 **Assistant Professor at Instituto de Física, Benemérita Universidad Autónoma de Puebla, Mexico.**
Master Level Courses : Mathematical Methods.
- 2004-2006 **Professor in the engineering department at Universidad del Valle de México, Puebla.**
Undergraduate Courses : Statics, Dynamics, Statistics for Psicology

1.4 Languages

Spanish	Mother tongue
English	Fluent
French	Fluent (TEF C1)
Italian	Basic conversation
Russian	Basic conversation

1.5 Programming Skills

Github repository can be found here github.com/isapedraza. Working projects in collaboration with the **Laboratorio Nacional de Supercomputo del Sureste (LNS)**, Mexico.

Operating systems	Fluent wih Unix/Linux commands; shell scripting and basic administration.
Expeirience in coding	Maplesoft, LabView, Mathematica, MATLAB, fortran, C, ROOT, C++, and python.
Basic knowledge	Qiskit (open source software development kit (SDK) for working with OpenQASM and the IBM Q quantum processors.)
Linux	Use of remote Unix-based computers clusters and supercomputers.
Machine learning	Toolkit for Multivariate Analysis (mainly Boosted Decision Trees and Artificial Neural Networks).
Parallel proگرامing	Working knowledge.

2 List of achievements

2.1 Present Leading Roles

- 2014–Present Member of the Academic and Technical Committee of the National Supercomputing Networking of **CONACyT** (National Council of Technology and Science) (**RedMexSu**)
- 2013–Present Member of the Academic and Technical Committee of the National Laboratory of Supercomputing of the Southwest (**LNS**)
- 2012–Present BUAP Deputy team leader within the **CMS Collaboration** .
- 2012–Present BUAP Institute representative within the RPC Group of the **CMS Collaboration** .
- 2012–Present BUAP Institute representative within the Muon Group of the **CMS Collaboration** .

2.2 Thesis Advisor

Degree	Former Student	Defended on	Title
Ph.D.	Jan Eysermans	January 31st, 2019	Search for Additional Higgs Bosons with the CMS Detector at the CERN LHC
M.Sc.	Mississippi Valenzuela	February 26th, 2018	Pruebas Estadísticas en la Física del Bosón de Higgs
B. A. Physics	Juan Fernández	January 25th, 2019	Índices de riesgo en modelo Adulto-Infante para la Influenza Estacional
B. A. Physics	Diana Leon	November 15th, 2018	Search for Monotop Production in Events with One Lepton, Missing Transverse Energy, and Jets
B. A. Physics	Brenda Fabela	May 17th, 2017	Estudio de los eventos de fondo para la búsqueda del bosón de Higgs Cargado con el experimento CMS del LHC

2.3 Grants

- 2018 Individual **VIIEP**-BUAP project 30k MXN
- 2017 Individual **VIIEP**-BUAP project 20k MXN
- 2016 Group **VIIEP**-BUAP project 20k MXN
- 2015 Group **VIIEP**-BUAP project 20k MXN
- 2015 **MIT-Mexico-BUAP Seed Found** Heavy Higgs Boson Searches 30k USD

2.4 Honors and Fellowships

2014	One of the 30 most important researcher in LA under 40 (LatinAmericanScience.org).
2014-presente	Member of the National System of Researchers (SNI)- Nivel I.
2012	INKTalks Fellow . Every year INK identifies and nurtures 20 young achievers who are redefining their fields of work or the world around them
2010-2013	Member of the National Sistem of Researhers (SNI)- Candidate.
2010-present	Jury of the National System of Scientific and Technological Evaluation (RCEA).
2009	Ph.D. with honors, IFUAP-BUAP
2006	HELEN Fellow (High Energy Physics Latin-American-European Network)
2005-2009	Ph.D. fellow of CONACYT .
2004-2005	Master fellow of Vicerrectoria de Investigación y Estudios de Posgrado.
2002-2004	Master fellow of CONACYT .
2001-2003	Undergraduate thesis fellow of CONACYT .

2.5 Chapters in books

2018	Beacham, J. et al. (2020). Physics Beyond Colliders at CERN: Beyond the Standard Model Working Group Report. <i>J. Phys. G</i> , 47(1):010501	author
2017	Collaboration, C. (2017). The Phase-2 Upgrade of the CMS Muon Detectors. Technical Report CERN-LHCC-2017-012. CMS-TDR-016, CERN, Geneva. This is a dummy submission, just to get the LHCC reference number	editor
2009	Admas, D. L., Fassouliotis, D., Flores Castillo, L. R., Kourkoumelis, C., Mel-lado Garcia, B. R., Pedraza-Morales, M. I., Vranjes, N., and Wu, S. L. (2009). Lepton plus missing transverse energy signals at high mass	author
2007	A. Palma, I. P. (2007). <i>Topics in the Theory Of Chemical and Physical Systems</i> , chapter On the time-dependent solutions of the Schrdinger equation. Springer	author

2.6 Papers

When part of extensive collaborations, I have shared the work with more than 3000 authors; all of us have contributed to and signed more than 1000 papers. The list below has a clickable link on the collaboration name that leads to the complete list of publications.

Years	Collaboration	Number of publications
2014-present	CMS Collaboration	719
2016-present	REDTOP	4
2007-2016	ATLAS Collaboration	284
2004	Pierre Auger	1
2007-2008	Doctoral Thesis	3
2007	M.Sc. Tehsis	1
2002-2007	Other collaborations	6
2001	Optics	1

2.6.1 Selected Papers

I have selected a set of them where I have played crucial and leading roles. My contributions go from detector performance improvements to data analysis to theoretical predictions and phenomenology approaches. For ATLAS and CMS publications, internal notes with few authors can be provided by request.

Year	Paper	Citations
2020	Beacham, J. et al. (2020). Physics Beyond Colliders at CERN: Beyond the Standard Model Working Group Report. <i>J. Phys. G</i> , 47(1):010501. <i>Contribution : Physics reach and impact that the experiment REDTOP could have in the search of Dark Photons and Dark scalars</i>	169
	Sirunyan, A. M. et al. (2020b). Search for charged Higgs bosons decaying into a top and a bottom quark in the all-jet final state of pp collisions at $\sqrt{s} = 13$ TeV. <i>JHEP</i> , 07:126. <i>Contribution : Work done together with a Ph.D. student for his Ph.D. Thesis.</i>	14
	Sirunyan, A. M. et al. (2020a). Search for a charged Higgs boson decaying into top and bottom quarks in events with electrons or muons in proton-proton collisions at $\sqrt{s} = 13$ TeV. <i>JHEP</i> , 01:096. <i>Contribution : Work done together with a Ph.D. student for his Ph.D. Thesis.</i>	29
2019	Sirunyan, A. M. et al. (2019). Search for charged Higgs bosons in the $H^\pm \rightarrow \tau^\pm \nu_\tau$ decay channel in proton-proton collisions at $\sqrt{s} = 13$ TeV. <i>JHEP</i> , 07:142. <i>Contribution : Work done together with a Ph.D. student for his Ph.D. Thesis.</i>	39
2018	Sirunyan, A. M. et al. (2018). Performance of the CMS muon detector and muon reconstruction with proton-proton collisions at $\sqrt{s} = 13$ TeV. <i>JINST</i> , 13(06):P06015. <i>Contribution : Improvement of the muon reconstruction system and operations</i>	309
2014	Chatrchyan, S. et al. (2014). Evidence for the 125 GeV Higgs boson decaying to a pair of τ leptons. <i>JHEP</i> , 05:104. <i>Contribution : Data driven background validation.</i>	391
2013	Aad, G. et al. (2013a). Evidence for the spin-0 nature of the Higgs boson using ATLAS data. <i>Phys. Lett.</i> , B726:120–144. <i>Contribution : Single channel analysis.</i>	448
	Aad, G. et al. (2013b). Measurements of Higgs boson production and couplings in diboson final states with the ATLAS detector at the LHC. <i>Phys. Lett.</i> , B726:88–119. [Erratum: <i>Phys. Lett.</i> B734,406(2014)] . <i>Contribution : Single channel analysis.</i>	552
2012	Aad, G. et al. (2012c). Combined search for the Standard Model Higgs boson using up to 4.9 fb^{-1} of pp collision data at $\sqrt{s} = 7$ TeV with the ATLAS detector at the LHC. <i>Phys. Lett.</i> , B710:49–66. <i>Contribution : Independent analysis, implemented the statistical combination of the discovery sensitivity in the software.</i>	621
	Aad, G. et al. (2012e). Search for the Standard Model Higgs boson in the decay channel $H \rightarrow ZZ^{(*)} \rightarrow 4\ell$ with 4.8 fb^{-1} of pp collision data at $\sqrt{s} = 7$ TeV with ATLAS. <i>Phys. Lett.</i> , B710:383–402. <i>Contribution : Electron quality reconstruction and analysis optimization.</i>	176
	Aad, G. et al. (2012a). A particle consistent with the Higgs Boson observed with the ATLAS Detector at the Large Hadron Collider. <i>Science</i> , 338:1576–1582. <i>Contribution : Independent analysis, implemented the statistical combination of the discovery sensitivity in the software.</i>	70

	Aad, G. et al. (2012d). Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC. <i>Phys. Lett.</i> , B716:1–29. <i>Contribution : Independent analysis, implemented the statistical combination of the discovery sensitivity in the software.</i>	6276
	Aad, G. et al. (2012f). Search for the Standard Model Higgs boson in the H to $\tau^+\tau^-$ decay mode in $\sqrt{s} = 7$ TeV pp collisions with ATLAS. <i>JHEP</i> , 09:070. <i>Contribution : Performed the complete data analysis.</i>	109
	Aad, G. et al. (2012b). ATLAS search for a heavy gauge boson decaying to a charged lepton and a neutrino in pp collisions at $\sqrt{s} = 7$ TeV. <i>Eur. Phys. J.</i> , C72:2241. <i>Contribution : Performed the complete data analysis.</i>	57
2011	Aad, G. et al. (2011a). Limits on the production of the Standard Model Higgs Boson in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector. <i>Eur. Phys. J.</i> , C71:1728. <i>Contribution : Independent analysis, implemented the statistical combination of the discovery sensitivity in the software.</i>	94
	Aad, G. et al. (2011c). Search for a heavy gauge boson decaying to a charged lepton and a neutrino in 1 fb^{-1} of pp collisions at $\sqrt{s} = 7$ TeV using the ATLAS detector. <i>Phys. Lett.</i> , B705:28–46. <i>Contribution : Performed the complete data analysis.</i>	83
	Aad, G. et al. (2011d). Search for neutral MSSM Higgs bosons decaying to $\tau^+\tau^-$ pairs in proton-proton collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector. <i>Phys. Lett.</i> , B705:174–192. <i>Contribution : Performed the complete data analysis.</i>	101
	Aad, G. et al. (2011b). Measurement of the W charge asymmetry in the $W \rightarrow \mu\nu$ decay mode in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector. <i>Phys. Lett.</i> , B701:31–49. <i>Contribution : Optimization of the analysis.</i>	75
2007	A. Palma, I. P. (2007). <i>Topics in the Theory Of Chemical and Physical Systems</i> , chapter On the time-dependent solutions of the Schrödinger equation. Springer <i>Contribution : M.Sc. Thesis, Found Time-dependent solutions to Schrödinger equation by using Operator Algebra and the Airy-Volkov Functions</i>	3
2006	Pedraza, I., R. A. S. H. (2008). Effects of charged Higgs bosons in the deep inelastic process $\nu_\tau N \rightarrow \tau^- X$ and the possibility of detecting tau-neutrinos at cosmic neutrino detectors. <i>Pramana</i> , 70:603–615. <i>Contribution : Ph.D. Thesis, calculation of the cross section</i>	
2005	Rodriguez-Meza, M. A., Cervantes-Cota, J. L., Pedraza, M. I., Tlapanco, J. F., and la Calleja, De, E. M. (2005). Potential-density pairs for axisymmetric galaxies: The Influence of scalar fields. <i>Gen. Rel. Grav.</i> , 37:823–829. <i>Contribution : Find solutions to the equations.</i>	13
2004	Abraham, J. et al. (2004). Properties and performance of the prototype instrument for the Pierre Auger Observatory. <i>Nucl. Instrum. Meth.</i> , A523:50–95. <i>Contribution : Studies of cosmic ray longitudinal profiles.</i>	788
2001	M., M. P. and Zurita, R. (2001). Propiedades de difracción en campo lejano de rejillas intercaladas de Ronchi. <i>Rev.Mex. de Física</i> , 47(3):253–259. <i>Contribution : secondary author</i>	10

2.7 *International Talks*

Event	Place and Date	Title
9th International Supercomputing Conference in Mexico	Mexico, March 2018	Certification of a Mexican site in the LHC-GRID for the Compact Muon Solenoid Experiment
XIV Resistive Plate Chamber 2018	Mexico, Feb. 2018	RPC upgrade project for CMS Phase II
8th International Supercomputing Conference in Mexico	Mexico, February 2017	Recursos de supercómputo usados por el experimento del Solenoide Compacto de Muones (CMS) del gran colisionador de hadrones.
XIII Resistive Plate Chamber 2016	Belgium, Feb. 2016	First results of CMS RPC performance at 13 TeV
BCVSPIN Advanced School in Particle Physics and Cosmology	México, Dec. 2014	CMS physics
Interconnection of Particle Physics and Cosmology PPC2014	México, Jun. 2014	Higgs Searches (CMS)
XXVII Reunión Anual de DPyC de la SMF	México, May. 2014	Upgrade of the RPC/CMS.
XIV Taller Mexicano de Partículas y Campos	México, Nov. 2013	Physics Beyond the Standard Model with the CMS detector, On behalf CMS.
LV Congreso Nacional de Física	México, Oct. 2011	El Descubrimiento De Una Nueva Partícula En La Búsqueda Del Bosón De Higgs.
LISHEP 2011	Brazil Jul. 2011	TeV Scale Resonances In ATLAS, On behalf ATLAS.
22nd Rencontres de Blois on Particle Physics and Cosmology	France, Jul. 2010	Projections For Non-SUSY Searches At The LHC For 200 pb-1 AND 1 fb-1, On behalf ATLAS.
Meeting of the Division of Particle and Fields of the American Physical Society	USA, Jul. 2009	Discovery Potential For Di-Lepton And Lepton+Etmis Resonances At High Mass With Atlas, On behalf ATLAS.
Signaling the Arrival of the LHC ERA	Italy, Dec. 2009	Discovery Potential Of A Charged Heavy Vector Boson With The Atlas Detector, On behalf ATLAS.
Workshop on Observing UHE Cosmic Rays	Cuba, Aug. 2000	Study Of Simulated Horizontal Air Showers Using Corsika Program

2.8 *Short Relevant Courses*

Title	Date	Place
The 2009 Hadron Collider Physics Summer School	8 – 17 Jun, 2009	Ginebra, Suiza
IV Mexican School On Astrophysics	18 – 23 Jul, 2005	Zacatecas, México
CTEQ Summer School On QCD Analysis And Phenomenology	9 – 27 May 2005	Puebla, México
Summer School Cosmos And Its Influence On Living Organisms	June 1 – Oct. 5, 2001	Moscú, Rusia
Third Caribbean Workshop On Quantum Mechanics Particles And Fields	15 – 22 Dec, 2000	La Habana, Cuba.
International Workshop On Observing Ultra High Energy Cosmic Rays	9 – 12 Aug, 2000	Metepc, México

2.9 *Outreach Events*

Year	Title	Institute	Type
2021	Conference for Undergraduate Women in Physics	American Physical Society	Chair
2020	International Education Symposium & Awards 2020	Smart Circuits India	Guest of Honour
2020	Cazadores de partículas	COGNiMATH	Seminar
2020	CMS virtual Data Analysis School	CMS	Jury
2020	Mediciones Relacionadas con el Higgs @LHC	FCFMBUAP	Seminar
2020	Alternative Reality and Research	Smart Circuits India	Round table
2019	CMS Vitual Visit	FCFMBUAP	Visit
2016	CMS Vitual Visit	FCFMBUAP	Visit
2015	CMS Vitual Visit	CICATA	Visit
2015	CMS listo para descubrir nueva física	SAP	Seminar
2015	Más allá del Bosón de Higgs con el LHC y CMS	AMECANICA	Conference
2015	Reinicio del LHC : CMS listo para descubrir nueva física	FCFM-BUAP	Seminar
2012	The Higgs BosonLike Particle Discovery	INK Talks in association with TED	Conference
2012	Del "Vacío" a la masa	Vicerrectoría de Investigación de la BUAP Revistas de Divulgación	Entrevista
2012	El descubrimiento de una Nueva Partícula en la Búsqueda del Bosón de Higgs	CONCYTEP , Nacional , Ferias Científicas y Tecnología	Talk
2010	Visita rápida al LHC y la física que se puede hacer con él	Sociedad Astronómica de Puebla "Germán Martínez Hidalgo"	Charla

2010	Resultados recientes del detector ATLAS del gran colisionador de hadrones en el CERN	Cuerpo Académico de Partículas Campos y Relatividad General, FCFM	Talk
2010	Mujer en el CERN	Univision Radio, La Voz del Pueblo , Extranjero , Radio	Interview
2010	CERN "Women in Physics"	Univision Radio, La Voz del Pueblo , Extranjero , Radio	Interview
2008	El Gran Colisionador de Hadrones (LHC)	Indigomedia, Revistas de Divulgación	Interview

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