

Fecha del CVA	11/10/2019
---------------	------------

Parte A. DATOS PERSONALES

Nombre y Apellidos	Luca Merlo		
DNI/NIE/Pasaporte		Edad	
Núm. identificación del investigador	Researcher ID		
	Scopus Author ID		
	Código ORCID	0000-0002-5876-4105	

A.1. Situación profesional actual

Organismo	Universidad Autónoma de Madrid		
Dpto. / Centro			
Dirección			
Teléfono		Correo electrónico	
Categoría profesional	Ramon Y Cajal	Fecha inicio	2017
Espec. cód. UNESCO	221202 - Partículas elementales; 221208 - Hadrones; 221209 - Leptones; 221210 - Masa; 221212 - Teoría cuántica de campos; 229001 - Física teórica altas energías		
Palabras clave	Física de partículas del universo primitivo; Señales de colisionadores; Extensiones de modelo standard; Física del sabor; Interacciones electrodébiles; Supersimetría y supergravedad		

A.2. Formación académica (título, institución, fecha)

Licenciatura/Grado/Doctorado	Universidad	Año
Scuola di Ricerca in Fisica	Università degli Studi di Padova	2010
Laura in fisica di II livello	Università degli Studi di Padova	2006
Laura in fisica di I livello	Università degli Studi di Padova	2004

A.3. Indicadores generales de calidad de la producción científica

From 2007, I participated in 13 international research projects. My production consists of 48 articles (ONLY 8 co-authored with my Ph.D. supervisor, testifying my research independence) published on scientific journals, 1 article waiting for publication in a scientific journal, 1 monography and 14 proceedings of conferences. It has received much attention from the community, reflected by a total number of 3721 inSPIRES citations, with 26 articles having more than 50 citations each, including 10 with more than 100 citations, and 60 average citations for each published paper. My h index is 33. I have been invited to give 23 plenary and parallel talks. I gave 24 seminars in different research centres and 3 lectures in international physics schools.

Parte B. RESUMEN LIBRE DEL CURRÍCULUM

CAREER:

- '10-12, postdoc at the Technische Universität München in the group of Prof. A. Buras.
- '12-15, Juan de la Cierva postdoc at the UAM.
- '15-16, Severo Ochoa postdoc at the Instituto de Física Teórica IFT of the UAM. I continue the main research activity of the previous years.
- From Jan '17, 'Ramon y Cajal' Tenure Track at the UAM.

TEACHING:

- AA 07/08 and 08/09 at Università degli Studi di Padova, tutor at the course of Physics at the 1st year of Biotechnology degree.

- AA 13/14 at UAM, assistant at the 1st year Physics laboratory.

- AA 14/15, 15/16, 16/17, 17/18, 18/19 and 19/20 at UAM, assistant at the course of Nuclear and Particle Physics at the 4th year of the Physics degree. - AA 16/17, 17/18, 18/19 and 19/20

at UAM, professor at the course of General Physics at the 1st year of the Telecommunication Engineering degree.

I supervised 7 master students from 2013 and I am currently supervising a master student and two PhD students.

SCIENTIFIC ACTIVITIES:

HIGGS RELATED:

i) Study of the Electroweak Symmetry Breaking mechanism, both in the case of a Standard Model Higgs particle and with a dynamical Higgs, being a non-exact Electroweak doublet or a pseudo-Nambu Goldstone boson arising from Composite Higgs models. ii) Construction of the chiral effective Lagrangian for a dynamical Higgs and study of the corresponding phenomenology (collider and flavour data), identifying strategies to disentangle the Higgs nature.

FLAVOUR RELATED:

i) Explanation of fermion masses and mixing patterns, especially with the help of flavour symmetries, in the framework of the Standard Model and of Grand Unified Theories with and without Supersymmetry. ii) Phenomenological analyses on the viability of flavour models. iii) Analysis of the Minimal Flavour Violation ansatz in beyond Standard Model theories, especially in the context of gauge flavour symmetries and in scenarios where the electroweak symmetry breaking is non-linearly realised.

DARK MATTER RELATED:

i) Study of the interactions of a Dark Matter candidate (being a scalar or a pseudo-Nambu Goldstone boson) in the context of a non-linearly realised Electroweak Symmetry Breaking mechanism. ii) Study of the connections between Dark Matter and Flavour Symmetries.

AXION RELATED:

i) Model independent analysis of Axion/ALP phenomenology at colliders and B-factories. ii) Study of axion/ALP arising withing specific flavour models and Composite Higgs models

REFEREE: I am referee for EPJC, JHEP, NPB, PLB, PRD, PRL. I have been awarded the "Certificate of Excellence in Reviewing" by PLB and NPB in '12, '13, '14 and '16.

ORGANIZER: I was organiser of HEFT2014 - Higgs Effective Field theories, of the Invisibles15 school and workshop, of the XXIV Xmas Workshop.

Parte C. MÉRITOS MÁS RELEVANTES (ordenados por tipología)

C.1. Publicaciones

- 1 **Artículo científico.** Luca Merlo; et al. 2019. Revisiting the production of ALPs at B-factories JHEP.
- 2 **Artículo científico.** Pawel Kozow; et al. 2019. Same-sign WW Scattering in the HEFT: Discoverability vs. EFT Validity JHEP.
- 3 **Artículo científico.** Javier Alonso Gonzalez; et al. 2019. Testable Axion-Like Particles In The Minimal Linear σ Model PRD.
- 4 **Artículo científico.** Merlo, L.; Rosauero-Alcaraz, S.2018. Predictive Leptogenesis from Minimal Lepton Flavour Violation JHEP. 1807, pp.036.
- 5 **Artículo científico.** Merlo, L.; Pobbe, F.; Rigolin, S.2018. The Minimal Axion Minimal Linear ? Model European Physics Journal C. 78, pp.415.
- 6 **Artículo científico.** Brivio, I.; et al. 2017. ALPs Effective Field Theory and Collider Signatures European Physics Journal C. 77, pp.572.
- 7 **Artículo científico.** Merlo, L.; Saa, S.; Sacristan-Barbero, M.2017. Baryon Non-Invariant Couplings in Higgs Effective Field Theory European Physics Journal C. 77, pp.185.
- 8 **Artículo científico.** Patricia Hernandez Leon; Luca Merlo. 2017. Distinguishing A Higgs-Like Dilaton Scenario With A Complete Bosonic Effective Field Theory Basis Phys. Rev.D-96, pp.75008.
- 9 **Artículo científico.** LHC HIGGS CROSS SECTION WORKING GROUP Collaboration. 2017. Handbook of LHC Higgs Cross Sections: 4. Deciphering the Nature of the Higgs Sector CERN Yellow Reports: Monographs. CERN. 2/2017, pp.1-849.
- 10 **Artículo científico.** Dinh, D.N.; et al. 2017. Revisiting Minimal Lepton Flavour Violation in the Light of Leptonic CP Violation JHEP. 07, pp.089.

- 11 **Artículo científico.** Arias-Aragon, F.; Merlo, L.2017. The Minimal Flavour Violating Axion JHEP. 10, pp.168.
- 12 **Artículo científico.** Gavela, B.; et al. 2016. Analysis of general power counting rules in effective field theory European Physics Journal C. 76, pp.485.
- 13 **Artículo científico.** Alonso, R.; et al. 2016. Gauged lepton flavour JHEP. 1612, pp.119.
- 14 **Artículo científico.** Brivio, I.; et al. 2016. Non-linear Higgs portal to Dark Matter JHEP. 1604, pp.141.
- 15 **Artículo científico.** Hierro, I.M.; Merlo, L.; Rigolin, S.2016. Sigma decomposition: the CP-odd Lagrangian JHEP. 1604, pp.016.
- 16 **Artículo científico.** Brivio, I.; et al. 2016. The complete HEFT Lagrangian after the LHC Run I European Physics Journal C. 76, pp.416.
- 17 **Artículo científico.** Johannes Bergstrom; Davide Meloni; Luca Merlo. 2014. A Bayesian comparison of U(1) lepton flavour models Phys. Rev.D89, pp.093021.
- 18 **Artículo científico.** M.B. Gavela; et al. 2014. CP violation with a dynamical Higgs JHEP. 1410, pp.44.
- 19 **Artículo científico.** Brivio, I.; et al. 2014. Disentangling a Dynamical Higgs JHEP. 1403, pp.024.
- 20 **Artículo científico.** I. Brivio; et al. 2014. Higgs Ultraviolet Softening JHEP. 12, pp.004.
- 21 **Artículo científico.** R. Alonso; et al. 2014. Sigma Decomposition JHEP. 12, pp.034.
- 22 **Artículo científico.** Lopez-Honorez, Laura; Merlo, Luca. 2013. Dark Matter Within the Minimal Flavour Violation Ansatz Phys.Lett.B722, pp.135-143.
- 23 **Artículo científico.** Alonso, R.; et al. 2013. Flavour with a Light Dynamical "Higgs Particle" Phys.Rev.D87, pp.055019-055019.
- 24 **Artículo científico.** Alonso, R.; et al. 2013. Leptonic Dynamical Yukawa Couplings JHEP. 1308, pp.069.
- 25 **Artículo científico.** Bazzocchi, Federica; Merlo, Luca. 2013. Neutrino Mixings and the S₄ Discrete Flavour Symmetry Fortsch.Phys.61, pp.571-596.
- 26 **Artículo científico.** Alonso, R.; et al. 2013. The Effective Chiral Lagrangian for a Light Dynamical "Higgs Particle" Phys.Lett.B722, pp.330-335.
- 27 **Artículo científico.** Altarelli, Guido; Feruglio, Ferruccio; Merlo, Luca. 2013. Tri-Bimaximal Neutrino Mixing and Discrete Flavour Symmetries Fortsch.Phys.61, pp.507-534.
- 28 **Artículo científico.** Altarelli, Guido; et al. 2012. Discrete Flavour Groups, theta₁₃ and Lepton Flavour Violation JHEP. 1208, pp.021-021.
- 29 **Artículo científico.** Alonso, R.; et al. 2012. Minimal Flavour Violation with Strong Higgs Dynamics JHEP. 1206, pp.076-076.
- 30 **Artículo científico.** Alonso, R.; et al. 2012. On the Potential of Leptonic Minimal Flavour Violation Phys.Lett.B715, pp.194-198.
- 31 **Artículo científico.** Buras, Andrzej J.; et al. 2012. Phenomenology of a Gauged SU(3)³ Flavour Model JHEP. 1203, pp.088-088.
- 32 **Artículo científico.** Altarelli, Guido; et al. 2012. Repressing Anarchy in Neutrino Mass Textures JHEP. 1211, pp.139-139.
- 33 **Artículo científico.** de Adelhart Toorop, Reinier; Bazzocchi, Federica; Paris, Alessio. 2011. Constraining Flavour Symmetries at the EW Scale I: the S₄ Higgs Potential JHEP. 1103, pp.035-035.
- 34 **Artículo científico.** de Adelhart Toorop, Reinier; et al. 2011. Constraining Flavour Symmetries at the EW Scale II: the Fermion Processes JHEP. 1103, pp.040-040.
- 35 **Artículo científico.** Merlo, Luca; Rigolin, Stefano; Zaldivar, Bryan. 2011. Flavour Violation in a Supersymmetric T' Model JHEP. 11, pp.047-047.
- 36 **Artículo científico.** Alonso, Rodrigo; et al. 2011. Minimal Flavour Violation Extensions of the Seesaw JHEP. 1106, pp.037-037.
- 37 **Artículo científico.** Alonso, R.; et al. 2011. On the Scalar Potential of Minimal Flavour Violation JHEP. 1107, pp.012-012.
- 38 **Artículo científico.** Buras, Andrzej J.; Merlo, Luca; Stamou, Emmanuel. 2011. The Impact of Flavour Changing Neutral Gauge Bosons on B_s to X_S gamma JHEP. 1108, pp.124-124.
- 39 **Artículo científico.** de Medeiros Varzielas, Ivo; Merlo, Luca. 2011. Ultraviolet Completion of Flavour Models JHEP. 02, pp.062-062.

- 40 **Artículo científico.** Feruglio, Ferruccio; et al. 2010. Lepton Flavour Violation in a Supersymmetric Model with A_4 Flavour Symmetry Nucl.Phys.B832, pp.251-288.
- 41 **Artículo científico.** Lin, Y.; Merlo, L.; Paris, A.2010. Running Effects on Lepton Mixing Angles in Flavour Models with Type I Seesaw Nucl.Phys.B835, pp.238-261.
- 42 **Artículo científico.** de Adelhart Toorop, Reinier; Bazzocchi, Federica; Merlo, Luca. 2010. The Interplay Between GUT and Flavour Symmetries in a Pati-Salam S_4 Model JHEP. 1008, pp.001-001.
- 43 **Artículo científico.** Aristizabal Sierra, D.; et al. 2010. Tri-Bimaximal Lepton Mixing and Leptogenesis Nucl. Phys.B827, pp.34-58.
- 44 **Artículo científico.** Feruglio, Ferruccio; Hagedorn, Claudia; Merlo, Luca. 2010. Vacuum Alignment in SUSY A_4 Models JHEP. 1003, pp.084-084.
- 45 **Artículo científico.** Bazzocchi, Federica; Merlo, Luca; Morisi, Stefano. 2009. Fermion Masses and Mixings in a S_4 -Based Model Nucl.Phys.B816, pp.204-226.
- 46 **Artículo científico.** Feruglio, Ferruccio; et al. 2009. Lepton Flavour Violation in Models with A_4 Flavour Symmetry Nucl.Phys.B809, pp.218-243.
- 47 **Artículo científico.** Bazzocchi, Federica; Merlo, Luca; Morisi, Stefano. 2009. Phenomenological Consequences of See-Saw in S_4 Based Models Phys.Rev.D80, pp.053003-053003.
- 48 **Artículo científico.** Altarelli, Guido; Feruglio, Ferruccio; Merlo, Luca. 2009. Revisiting Bimaximal Neutrino Mixing in a Model with S_4 Discrete Symmetry JHEP. 0905, pp.020-020.
- 49 **Artículo científico.** Feruglio, Ferruccio; et al. 2007. Tri-Bimaximal Neutrino Mixing and Quark Masses from a Discrete Flavour Symmetry Nucl.Phys.B775, pp.120-142.
- 50 **Libro o monografía científica.** Dr.2010. Phenomenology of Discrete Flavour Symmetries Discrete Flavour Symmetries: a phenomenological dissertation on flavour models and their experimental constraints. LAP LAMBERT Academic Publishing.

C.2. Proyectos

- 1 Centro de Excelencia Severo Ochoa (SEV-2016-0597) Luis Ibáñez Santiago. (Instituto de Física Teórica). 01/07/2017-30/06/2021. 4.000.000 €.
- 2 ITN-Elusives Belen Gavela Legazpi. (Universidad Autónoma de Madrid). 01/04/2016-31/03/2020. 3.855.581 €.
- 3 RISE-Invisibles Plus Belen Gavela Legazpi. (Universidad Autónoma de Madrid). 01/02/2016-31/01/2020. 2.070.000 €.
- 4 FPA-2016-78645 Maria José Herrero Solans. (Universidad Autónoma de Madrid). 30/12/2016-29/12/2019. 250.000 €.
- 5 Centro de Excelencia Severo Ochoa (SEV-2012-0249) Luis Ibáñez Santiago. (Instituto de Física Teórica). 01/07/2013-30/06/2017. 4.000.000 €.
- 6 Advance ERC Grant "Flavour" Andrzej Buras. (Institute for Advanced Study). 01/05/2011-30/04/2016. 1.600 €.
- 7 ITN-Invisibles Belen Gavela Legazpi. (Universidad Autónoma de Madrid). 01/04/2012-31/03/2016. 3.823.903 €.
- 8 FPA-2012-35880 Enrique Álvarez Vázquez. (Universidad Autónoma de Madrid). 01/01/2012-31/12/2015. 297.000 €.
- 9 Unification in the LHC Era Ignatios Antoniadis. (CERN). 01/10/2009-30/09/2013. 3.673.966 €.
- 10 IAS Senior Hans Fisher Gino Isidori. (Technische Universitat Munchen). 01/11/2009-31/10/2012.
- 11 Iniziativa Specifica PD21 Stefano Rigolin. (INFN). 01/01/2008-31/12/2010.
- 12 La ricerca di una teoria unificata nell'era di LHC Ferruccio Feruglio. (Università degli Studi di Padova). 09/02/2007-08/02/2009. 65.260 €.

C.3. Contratos

C.4. Patentes