

# LUIZ VALE SILVA

Curriculum Vitae

## Personal Data

Full name: Luiz Henrique Vale Silva

Institute: **Universidad Cardenal Herrera**  
**Departamento de Matemáticas, Física y Ciencias Tecnológicas**  
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## Present Position

09/24 ▷ **Researcher Professor** at Universidad CEU Cardenal Herrera (Valencia, Spain)

## Previous Post-doctoral Contracts

11/23-09/24 ▷ **Extension of MSCA-IF** from CSIC, charming-*Deca* $\bar{D}e$

11/21-10/23 ▷ **Marie Skłodowska-Curie Individual Fellowship** at IFIC, UV - CSIC (Valencia, Spain)  
charming-*Deca* $\bar{D}e$ : “A charming decade: using colliders to probe the charm sector of the Standard Model and Beyond” (project ID number 101031558, Horizon 2020)

10/19-10/21 ▷ **Post-doctoral researcher** at IFIC, UV - CSIC (Valencia, Spain)  
Local collaborations with: A. Pich, G. Rodrigo

09/17-09/19 ▷ **Post-doctoral researcher** at Theo. Particle Physics Group, U. of Sussex (Brighton, UK)  
Local collaborations with: S. Jäger

10/16-08/17 ▷ **Visitor scientist** at IJS - Jožef Stefan Institute (Ljubljana, Slovenia)  
Local collaborations with: S. Fajfer, J. F. Kamenik, N. Košnik

## Education

10/13-09/16 ▷ **PhD thesis:** “Phenomenology of Left-Right models in the quark sector”, supervised by S. Descotes-Genon (IJCLab) and V. Bernard (IJCLab), in France

09/11-07/13 ▷ Master program on High Energy Physics at *Ecole Polytechnique*, France

01/10-07/11 ▷ Engineering program at *Ecole Polytechnique*, France

03/06-11/09 ▷ Bachelor in “Applied and Theo. Physics” at *Universidade de São Paulo (USP)*, Brazil

## Long Scientific Stays and Internships

- 03-06/23 ▷ Three-months stay at CERN, theory group
- 11/22 ▷ One-month stay at IJS - Jožef Stefan Institute (Ljubljana, Slovenia)
- 02-07/13 ▷ **Master thesis:** “Setting constraints on Left-Right models: the  $b \rightarrow c\ell\nu$  transition”  
Supervisors: S. Descotes-Genon (IJCLab) and V. Bernard (IJCLab)
- 04-07/12 ▷ “Nucleation and classical propagation of inflationary bubbles”  
Supervisor: M. Bucher (APC-Paris 7)
- 12/10-05/11 ▷ “Gamma astronomy and the Fermi telescope”, partial-time research  
Main supervisor: B. Giebels (LLR-Ecole Polytechnique, France)
- 01-02/09 ▷ “Growth and formation of Ge-nanoparticles embedded in silica”  
Supervisors: G. Azevedo and A. Gasperini (LNLS, Brazil)
- 2008-2009 ▷ “Introduction to Differential Geometry and General Relativity”  
Supervisor: D. Vanzella (IFSC-USP, Brazil)
- 2006 ▷ Internship on math (geometry, graphs, numbers, probability)  
Main supervisor: S. Zani (ICMC-USP, Brazil)

## Awards, Selections, Funding

- 2023 ▷ IFCER2022 *ayuda de extensión* CSIC: **extension of MSCA-IF**
- 2021 ▷ Admitted to **Marie Skłodowska-Curie Individual Fellowship** (total score: 96.00%)
- 2010 ▷ Admitted to Ecole Polytechnique with an **Eiffel excellence grant**
- 2009 ▷ 6th place, V Young Physicists Prize, IFT-Unesp (Brazil)
- 2009 ▷ Fellowship of FAPESP (Brazil) for scientific project on General Relativity
- 2008 ▷ 5th place, IV Young Physicists Prize, IFT-Unesp (Brazil)
- 2008 ▷ 1st place, Brazilian competition: for formulating a problem in physics  
(*Concurso brasileiro de problemas de física*)
- 2006 ▷ Admitted to Universidade de São Paulo (USP)
- 2005 ▷ Brazilian public schools math tournament:  
admitted to a specialization program in math

## Supervision of Students

- 2023-2024 ▷ Master student, Ms. Miriam Camarasa Domene (U. of Valencia) – official director
- 2021-present ▷ PhD candidate, Mr. Sergio Ferrando Solera (U. of Valencia) – official co-director
- 2019-2024 ▷ Dr. Eleftheria Solomonidi (U. of Valencia) – official PhD co-director
- 2019-2023 ▷ **Qualified for recruitment** as *maître de conférences* in Universities in France
- 2017-2019 ▷ Dr. Kirsten Leslie (U. of Sussex) – non-official PhD co-supervision

## Teaching

- 2024-present ▷ Teacher assistant at University Cardenal Herrera  
Courses: Calculus, Physics
- 2017-2019 ▷ Teacher assistant at University of Sussex  
Courses: Advanced Quantum Mechanics, and Introduction to Quantum Field Theory  
Hours (*homework corrections*): 36
- 2013-2016 ▷ Teacher assistant at Univ. Paris-Sud: 1st, 2nd, and 3rd year undergrad students  
Courses, among others: Point and fluid Mechanics, Optics, E.M.  
*Heures équivalent TD*: 194

## Large Collaborations

- 2023-present ▷ Participation in *Quantum Spain* (Valencian node)
- 2023-present ▷ European Committee for Future Accelerators (ECFA)  $e^+e^-$  Higgs Factory, supervisor of the working group “Expert team  $b \rightarrow sll$  and vertex detector”
- 2013-present ▷ Member of CKMfitter ([ckmfitter.in2p3.fr](http://ckmfitter.in2p3.fr))

## Institutional Responsibilities

- 2023-2024 ▷ Organizer of group meetings at the LHCPHeno group, University of Valencia
- 2018-2019 ▷ Organizer of seminars at the Theoretical Particle Physics Group, University of Sussex
- 2014-2015 ▷ Organizer of PhD seminars at LPT, Paris-Sud
- 2009 ▷ Intern in a junior enterprise hosted by a physics department, IFSC-USP (Brazil)

## Reviewing Activities

- ▷ Referee, HORIZON-MSCA-PF
- ▷ Referee, Physical Review D (PRD)
- ▷ Referee, Journal of High Energy Physics (JHEP)

## Talks in Conferences, Workshops and Schools

- 06/2024 ▷ LHCPHENO 2024 (Valencia, Spain)
- 06/2024 ▷ PLANCK 2024 (Lisbon, Portugal)
- 05/2024 ▷ 8<sup>th</sup> Red LHC Workshop (Madrid, Spain)
- 08/2023 ▷ EPS (*European Physical Society*) - HEP2023 (Hamburg, Germany)
- 07/2023 ▷ *International Workshop on Charm Physics* – CHARM (Siegen, Germany)
- 07/2022 ▷ *International Conference on High Energy Physics* – ICHEP (Bologna, Italy)
- 06/2022 ▷ 9<sup>th</sup> FLASY 2022 (Lisbon, Portugal)
- 05/2022 ▷ 6<sup>th</sup> Red LHC Workshop (Madrid, Spain)

- 07/2021 ▷ EPS (*European Physical Society*) - HEP2021 (Hamburg, Germany)
- 04/2021 ▷ *Rencontres de Physique des Particules* virtuelles (Tours, France)
- 07/2020 ▷ *International Conference on High Energy Physics – ICHEP* (Prague, Czech Rep.)
- 06/2020 ▷ *Conference on Flavour Physics and CP violation – FPCP* (A Toxa, Spain)
- 01/2020 ▷ *Rencontres de Physique des Particules* (Paris, France)
- 12/2019 ▷ *Precision probes of New Physics* (Valencia, Spain)
- 07/2019 ▷ EPS (*European Physical Society*) - HEP2019 (Ghent, Belgium)
- 11/2017 ▷ *NExT Physics Meeting* (London, UK)
- 01/2016 ▷ *Rencontres de Physique des Particules* (Annecy, France)
- 01/2015 ▷ *Rencontres de Physique des Particules* (Paris, France)
- 10/2014 ▷ *Flavorful Ways to New Physics* (Freudenstadt, Germany)

### **Invited Talks in Conferences and Workshops**

- 04/2024 ▷ *2nd CharmInDor mini-workshop* (Dortmund, Germany)
- 04/2024 ▷ Meeting of the Flavour sub-Working Group, of ECFA Working Group 1 (CERN)
- 03/2024 ▷ *Moriond EW* (La Thuile, Italy)
- 01/2024 ▷ *The 2024 International Workshop on Future Tau Charm Facilities* (Hefei, China)
- 01/2024 ▷ *IFIC Scientific Day, L3: flavour and quark matter* (Valencia, Spain)
- 10/2023 ▷ *Belle II Physics Week* (KEK)
- 10/2023 ▷ *Implications of LHCb measurements and future prospects* (CERN)
- 09/2023 ▷ *CKM Unitarity Triangle – CKM23* (Santiago, Spain)
- 06/2023 ▷ Workshop PhenoBR 2023 (Natal, Brazil)
- 02/2023 ▷ *Mini-workshop in Theory*, IAS & HKUST (Hong Kong)
- 01/2023 ▷ *6th FCC Physics Workshop* (Krakow, Poland)
- 11/2021 ▷ *CKM Unitarity Triangle – CKM21* (Melbourne, Australia)
- 08/2021 ▷ *20<sup>th</sup> Lomonosov Conference on Elementary Particle Physics* (Moscow, Russia)
- 04/2019 ▷ *Precision era in High Energy Physics* (Portorož, Slovenia)
- 12/2018 ▷ *New physics in kaon and beam-dump experiments* (Birmingham, UK)
- 09/2018 ▷ *CKM Unitarity Triangle – CKM18* (Heidelberg, Germany)
- 04/2018 ▷ *From Flavour to New Physics* (Lyon, France)
- 04/2018 ▷ *Towards the Ultimate Precision in Flavour Physics* (Warwick, UK)
- 01/2018 ▷ *Mini FCC-*ee* Workshop* (CERN)

- 01/2018 ▷ *2nd FCC Physics Workshop* (CERN)
- 01/2018 ▷ *LHCb Workshop* (Glasgow, UK)
- 09/2017 ▷ *UK Flavour 2017* (Durham, UK)
- 05/2017 ▷ *GDR-QCD: Progresses in algorithms and numerical tools for QCD* (Orsay, France)
- 04/2017 ▷ *NP at the junction of flavor and collider pheno* (Portorož, Slovenia)
- 01/2017 ▷ *1st FCC Physics Workshop* (CERN)
- 10/2016 ▷ *Selected topics in flavor and collider physics* (Brda, Slovenia)

### Local Seminars and Colloquia

- 01/24 ▷ Seminar at *Institute of High Energy Physics IHEP/UCAS* (Beijing, China)
- 11/23 ▷ LHCPheno Journal Club at IFIC (Valencia, Spain)
- 04/23 ▷ Talk at CERN's Quantum Technology Initiative-TH Forum (Geneva)
- 02/23 ▷ Colloquium at the Physics Department of the *Instituto Superior Técnico* (Lisbon)
- 11/22 ▷ Seminar at *Jožef Stefan Institute* (Ljubljana)
- 01/20, 02/21 ▷ BSM Journal Clubs at IFIC (Valencia, Spain)
- 11/2019 ▷ Seminar at *Laboratoire de Physique Théorique – LPT* (Orsay, France)
- 11/2019 ▷ Talk given at *CKMfitter* meeting (Orsay, France)
- 01/2019 ▷ Seminar at *Oxford University* (Oxford, UK)
- 11/17, 07-12/18 ▷ Seminars at *University of Sussex* (Brighton, UK)
- 04-05/16 ▷ Seminars at *Université Libre de Bruxelles*, *Jožef Stefan Institute* (Ljubljana), *Institut Ruđer Bošković* (Zagreb), *Laboratoire de Physique Théorique* (Paris)
- 05-11/14, 09/15 ▷ Talks given at *CKMfitter* meetings (Annecy-le-Vieux, Paris, Mainz)
- 01/2015 ▷ Young researcher seminars at LPT (Paris-Sud)

### Posters

- 06/2016 ▷ *Physique des 2 Infinis et des Origines Scientific Council* (Paris)
- 02/2016 ▷ 24<sup>o</sup> Colloque Alain Bouyssy, Univ. Paris-Sud
- 12/2014 ▷ *Physique des 2 Infinis et des Origines Scientific Council* (Paris)
- 11/2009 ▷ Workshop for undergraduate science students
- 02/2009 ▷ Workshop for synchrotron light users, LNLS (Brazil)

## Scientific Outreach

- 2010 ▷ Guided visit to the Center of Historical Resources at Ecole Polytechnique,  
*Nuit des chercheurs 2010*
- 2009 ▷ Member of the organizing committee for the “Undergraduate series of lectures and workshop for science students”, IFSC-USP (Brazil)
- 07/2008 ▷ Monitor in the “School on physics for high school students”,  
IFSC-USP (Brazil)
- 2007-2008 ▷ Science diffusion at the astronomical observatory  
Dietrich Schiel in São Carlos, Brazil

## Languages

- Portuguese ▷ native
- French, English ▷ fluent
- Spanish ▷ advanced

# List of Scientific Works

Please note: authors are conventionally ordered alphabetically in the field of High Energy Physics.

## Pre-prints

- ▶ H. Gisbert, A. Rodríguez-Sánchez, L. Vale Silva, “Baryon number violation with top quark operators in the SMEFT,” [arXiv hep-ph: 2409.00218].

## Publications in peer-reviewed scientific journals

- ▶ L. Vale Silva, “Effects of squared four-fermion operators of SMEFT on meson-mixing,” Phys. Rev. D **110**, no. 1, 016006 (2024).
- ▶ S. Fajfer, E. Solomonidi, L. Vale Silva, “ $S$ -wave contribution to rare  $D^0 \rightarrow \pi^+\pi^-\ell^+\ell^-$  decays in the Standard Model and sensitivity to New Physics,” Phys. Rev. D **109**, no. 3, 036027 (2024).
- ▶ S. Ferrando Solera, A. Pich, L. Vale Silva, “Direct bounds on Left-Right gauge boson masses at LHC Run 2,” JHEP **02**, 027 (2024).
- ▶ G. Clemente, A. Crippa, K. Jansen, S. Ramírez-Uribe, A. E. Rentería-Olivo, G. Rodrigo, G. F. R. Sborlini, L. Vale Silva, “Variational quantum eigensolver for causal loop Feynman diagrams and acyclic directed graphs,” Phys. Rev. D **108**, no. 9, 096035 (2023).
- ▶ A. Pich, E. Solomonidi, L. Vale Silva, “Final-state interactions in the CP asymmetries of charm-meson two-body decays,” Phys. Rev. D **108**, no. 3, 036026 (2023).
- ▶ S. Ramírez-Uribe, A. E. Rentería-Olivo, G. Rodrigo, G. F. R. Sborlini, L. Vale Silva, “Quantum algorithm for Feynman loop integrals,” JHEP **05**, 100 (2022).
- ▶ J. Charles, S. Descotes-Genon, Z. Ligeti, S. Monteil, M. Papucci, K. Trabelsi, L. Vale Silva, “New physics in  $B$  meson mixing: future sensitivity and limitations,” Phys. Rev. D **102**, no. 5, 056023 (2020).
- ▶ V. Bernard, S. Descotes-Genon, L. Vale Silva, “Constraining the gauge and scalar sectors of the doublet left-right symmetric model,” JHEP **09**, 088 (2020).
- ▶ S. Fajfer, N. Košnik, L. Vale Silva, “Footprints of leptoquarks: from  $R_{K^{(*)}}$  to  $K \rightarrow \pi\nu\bar{\nu}$ ,” Eur. Phys. J. C **78**, no. 4, 275 (2018).
- ▶ J. F. Kamenik, S. Monteil, A. Semkiv, L. Vale Silva, “Lepton polarization asymmetries in rare semi-tauonic  $b \rightarrow s$  exclusive decays at FCC- $ee$ ,” Eur. Phys. J. C **77**, no. 10, 701 (2017).
- ▶ J. Charles, S. Descotes-Genon, V. Niess, L. Vale Silva, “Modeling theoretical uncertainties in phenomenological analyses for particle physics,” Eur. Phys. J. C **77**, no. 4, 214 (2017).
- ▶ V. Bernard, S. Descotes-Genon, L. Vale Silva, “Short-distance QCD corrections to  $K^0\bar{K}^0$  mixing at next-to-leading order in Left-Right models,” JHEP **1608**, 128 (2016).
- ▶ J. Charles *et al.*, “Current status of the Standard Model CKM fit and constraints on  $\Delta F = 2$  New Physics,” Phys. Rev. D **91**, no. 7, 073007 (2015).

## Conference proceedings

- ▶ L. Vale Silva, A. Pich, E. Solomonidi, Future Tau Charm Facilities 2024: “Final-state interactions in the CP asymmetry of  $D$  meson two-body decays,” to appear in *Int. J. Mod. Phys. A (IJMPA-D-24-00150)*.
- ▶ S. Ferrando Solera, A. Pich, L. Vale Silva, Moriond EW 2024: “Direct bounds on Left-Right gauge boson masses,” [arXiv hep-ph: 2405.08772].
- ▶ L. Vale Silva, CKM 2023: “2023 update of the extraction of the CKM matrix elements,” [arXiv hep-ph: 2405.08046].
- ▶ L. Vale Silva, S. Fajfer, E. Solomonidi, EPS-HEP2023: “ $S$ -wave contribution to rare  $D^0 \rightarrow \pi^+\pi^-\ell^+\ell^-$  decays in the Standard Model and sensitivity to New Physics,” PoS **EPS-HEP2023**, 353 (2024).
- ▶ L. Vale Silva, A. Pich, E. Solomonidi, ICHEP2022: “Final-state interactions in the CP-asymmetry of  $D$  meson two-body decays,” PoS **ICHEP2022**, 748 (2022).
- ▶ V. Chobanova, M. Wingate, Y. Yusa *et al.*, CKM2021: “Summary of Working Group 4: Mixing and mixing-related CP violation in the  $B$  system:  $\Delta M$ ,  $\Delta\Gamma$ ,  $\phi_s$ ,  $\phi_1/\beta$ ,  $\phi_2/\alpha$ ,  $\phi_3/\gamma$ ,” PoS **CKM2021** (2023) 017, [arXiv hep-ph: 2205.15662].
- ▶ L. Vale Silva, CKM2021: “New physics in  $B$  meson mixing: future sensitivity and limitations,” PoS **CKM2021**, (2023) 110.
- ▶ L. Vale Silva, 20<sup>th</sup> Lomonosov: “Using dipole processes to constrain the flavor of New Physics effective interactions,” *Moscow Univ. Phys.* 77, 152–155 (2022).
- ▶ L. Vale Silva, EPS-HEP2021: “Probing squared four-fermion operators of SMEFT with meson-mixing,” PoS **EPS-HEP2021**, 519 (2022).
- ▶ L. Vale Silva, S. Jäger, K. Leslie, FPCP 2020 & ICHEP2020: “Using dipole processes to constrain the flavour of four-fermion effective interactions,” PoS **ICHEP2020**, 434 (2021).
- ▶ S. Jäger, K. Leslie, L. Vale Silva, EPS-HEP2019: “Probing the flavor of New Physics with dipoles,” PoS **EPS-HEP2019**, 248 (2020).
- ▶ L. Vale Silva, CKM 2018: “Update of the extraction of the CKM matrix elements,” [arXiv hep-ph: 1812.04396].
- ▶ L. Vale Silva, FWNP: “Constraining the Doublet Left-Right Model,” PoS **FWNP**, 020 (2015).

## Participation in the European Committee for Future Accelerators $e^+e^-$ Higgs Factory

- ▶ J. de Blas *et al.*, “Focus topics for the ECFA study on Higgs / Top / EW factories,” [arXiv hep-ph: 2401.07564].

## Participation in the FCC Conceptual Design Report

- ▶ A. Abada *et al.* [FCC Collaboration], “HE-LHC: The High-Energy Large Hadron Collider : FCC Conceptual Design Report Volume 4,” *Eur. Phys. J. ST* **228**, no. 5, 1109 (2019).
- ▶ A. Abada *et al.* [FCC Collaboration], “FCC-hh: The Hadron Collider : Future Circular Collider Conceptual Design Report Volume 3,” *Eur. Phys. J. ST* **228**, no. 4, 755 (2019).
- ▶ A. Abada *et al.* [FCC Collaboration], “FCC-ee: The Lepton Collider : Future Circular Collider Conceptual Design Report Volume 2,” *Eur. Phys. J. ST* **228**, no. 2, 261 (2019).
- ▶ A. Abada *et al.* [FCC Collaboration], “FCC Physics Opportunities : Future Circular Collider Conceptual Design Report Volume 1,” *Eur. Phys. J. C* **79**, no. 6, 474 (2019).



## PhD thesis

- ▶ L. Vale Silva, “Phenomenology of Left-Right Models in the quark sector,” [arXiv hep-ph: 1611.08187], tel-01412405, 2016SACLS249.