

Mikael Chala

*Dpto. Física Teórica y del Cosmos
Campus de Fuentenueva, Universidad de Granada
18071 Granada, España*

PERSONAL DETAILS

Date of birth	May 26, 1987
Current position	Ramón y Cajal researcher
Phone	+34 958 24 17 26
E-mail address	mikael.chala@ugr.es

EDUCATION

PhD in Theoretical Physics

October 2011 – June 2014

Universidad de Granada

PhD in Theoretical Physics. Thesis, *Collider Signatures of a Non-Standard Higgs Sector*, supervised by Prof. Francisco del Águila and Dr. José Santiago. Defense date: June 24, 2014. Committee members: Manuel Masip, Manuel Pérez-Victoria, Geraldine Servant, Andreas Weiler and Verónica Sanz.

Grade: sobresaliente cum laude & extraordinary prize.

MSc. in Theoretical Physics

October 2010 – September 2011

Universidad de Granada

MSc. in Advanced Techniques and Methods in Physics. Thesis, *Searches for new quarks at the LHC via the associated production channel*, supervised by Dr. José Santiago. Committee members: Fernando Cornet, José Ignacio Illana and Mar Bastero-Gil.

Grade: 9.8/10.

BSc. + MSc. in Physics

October 2005 – July 2010

Universidad de Granada

Spanish *Licenciatura degree* in Physics, equivalent in scope to an American postgraduate Master's degree. Concentration in theoretical and mathematical physics.

Grade: sobresaliente.

PREVIOUS POSITIONS

Newton international fellow

November 2017 – October 2019

IPPP (Durham, United Kingdom)

Postdoctoral fellow

November 2016 – October 2017

IFIC-University of Valencia/CSIC (Valencia, Spain)

Postdoctoral fellow

DESY (Hamburg, Germany)

November 2014 – October 2016

Doctoral student

Universidad de Granada (Granada, Spain)

October 2010 – October, 2014

TEACHING

Quantum Mechanics

*75 hours, theory, Grado en Física
Universidad de Granada (Granada, Spain)*

September 2023 – January 2024

Quantum Mechanics

*75 hours, theory, Grado en Física
Universidad de Granada (Granada, Spain)*

September 2022 – January 2023

Física Más Allá del Modelo Estándar

*30 hours, theory, curso de máster
Universidad de Granada (Granada, Spain)*

February – June 2022

Mecánica

*45 hours, theory, Grado en Física
Universidad de Granada (Granada, Spain)*

February – June 2022

Mecánica

*75 hours, theory, Grado en Física
Universidad de Granada (Granada, Spain)*

February – June 2021

Mecánica

*75 hours, theory, Grado en Física
Universidad de Granada (Granada, Spain)*

February – June 2020

Foundations of physics I

*9 hours, tutorial, Bachelor in Physics
Durham University (Durham, United Kingdom)*

January – May 2018

Introduction to composite Higgs models

*18 hours, tutorial, PhD course
University of Porto (Porto, Portugal)*

March – April 2018

Physics of the Standard Model

*56 hours, theory, master course
University of Hamburg (Hamburg, Germany)*

May – July 2016

Introducción a GNU/Linux
15 hours, theory, free elective credits
Universidad de Granada (Granada, Spain)

May 2014

Mecánica
30 hours, tutorial, Grado en Física
Universidad de Granada (Granada, Spain)

February – June 2014

Física de los procesos biológicos
30 hours, tutorial, Grado en Biología
Universidad de Granada (Granada, Spain)

February – June 2014

Introducción a GNU/Linux
15 hours, theory, free elective credits
Universidad de Granada (Granada, Spain)

May 2013

BACHELOR STUDENTS

Marina Calatrava Ramírez
Physics (University of Granada)

2023

Title: *Mecánica cuántica: Historias consistentes*. Defense date: June 30, 2023. Committee members: Tomás Ruiz Lara, Juan Luis Ortega Vinuesa, Joaquín Torres Agudo.
Grade: 9.5/10.

José Luis Llorca Sánchez
Mathematics (University of Granada)

2022

Title: *Renormalización en teoría de perturbaciones*. Defense date: July 12, 2022. Committee members: Ramón Gutiérrez Sánchez, Eduardo Nieto Arco, Pedro González Rodelas.
Grade: 6.5/10.

Rubén Fernández Jurado
Mathematics (University of Granada)

2022

Title: *Mecánica hamiltoniana en variedades*. Defense date: June 30, 2022. Committee members: Francisco José López Fernández, Antonio Moreno Galindo, María Isabel Berenguer Maldonado.
Grade: 9.9/10.

Ione Manuel Morales Rosales
Physics (University of Granada)

2020

Title: *Búsqueda de nuevas partículas en desintegraciones de mesones B*. Defense date: September 14, 2020. Committee members: Antonio Lallena, Francisco de los Santos and Juan Luis Guerrero.
Grade: 8.8/10.

PHD STUDENTS

Álvaro Díaz Carmona

Universidad de Granada

Thesis, *Renormalisation of the standard model effective field theory to higher order.*

July 2021 – Today

Maria Ramos

Braga University

Thesis, *Collider and astrophysical signatures of non-minimal composite Higgs models*, co-supervised with Dr Nuno Castro. Defense date: January 28, 2022. Committee members: Orfeu Bertolami, Ilaria Brivio, Laura López-Honórez, José Ignacio Illana, António Onofre and Mikhail Vasilevskiy.

Grade: sobresaliente *cum laude* & extraordinary prize.

November 2017 – September 2021

Julien Alcaide

University of Valencia

Thesis, *Neutrino masses and their implications for low energy experiments and the LHC*, co-supervised with Prof. Arcadi Santamaria. Defense date: July 22, 2020. Committee members: José Ignacio Illana, Enrique Fernández Martínez and Mariam Tórtola.

Grade: sobresaliente *cum laude*.

June 2017 – July 2020

RESEARCH STAYS (AT LEAST ONE MONTH)

IPPP Durham

Durham, United Kingdom (one month)

January 24 – February 20, 2022

Charles university

Prague, Czech Republic (two months)

October 20 – December 15, 2019

University of Minho

Braga, Portugal (one month)

April 17 – May 14, 2017

ETH Zurich

Zurich, Switzerland (two months)

September 1 – October 31, 2014

CERN

Geneva, Switzerland (three months)

September 1 – November 30, 2013

CERN

Geneva, Switzerland (three months)

July 1 – September 30, 2010

ORGANIZATION OF CONFERENCES

VI FTAE Xmas Workshop

December 2022

Granada (Spain)

Participation as leading organizer.

HEFT 2022

Granada (Spain)

Participation as leading organizer.

June 2022

V FTAE Xmas Workshop

Granada (Spain)

Participation as leading organizer.

December 2021

HEFT 2020

Granada (Spain)

Participation as leading organizer.

April 2020

Interdisciplinary approach to QCD-like composite dark matter

Trento (Italy)

Participation as leading organizer.

October 2018

BSM faces LHC run-2 realities

Hamburg (Germany)

Participation as co-organizer.

September 2016

INVITED LECTURES

The Standard Model and open problems

12th IDPASC School

(Granada, Spain)

September 2023

The Standard Model and open problems

11th IDPASC School

(Olomouc, Czech Republic)

September 2022


Introduction to composite Higgs models

University of Bern

(Bern, Switzerland)

March 2017

TALKS AT CONFERENCES

Invited presentations are labeled with 

51. **The structure of the dimension-8 anomalous dimension matrix** July 11, 2023
Plenary talk at “Standard Model at the LHC 2023”
(Chicago, United States; July 11 – 13, 2023)
[online participation]
50. **Constraints on anomalous dimensions from the positivity of the S-matrix** June 19, 2023
Plenary talk at “HEFT 2023”
(Manchester, United Kingdom; June 19 – 21, 2023)
49. **Understanding the quantum structure of the dimension-eight SMEFT** June 7, 2023
Plenary talk at “The 5th NPKI workshop”
(Busan, South Korea; June 5 – 9, 2023)
48. **Constraints on anomalous dimensions from the positivity of the S-matrix** April 17, 2023
Plenary talk at “LHC EFT working group meeting”
(CERN, Switzerland; April 14, 2023)
[online participation]
47. **Overview of composite Higgs models** April 14, 2023
Plenary talk at “ECFA HTE meeting on standard and exotic scalars at future factories”
(CERN, Switzerland; April 14, 2023)
[online participation]
46. **Rare decays in the ν SMEFT** September 23, 2022
Plenary talk at “ECFA HTE meeting on Z pole physics”
(CERN, Switzerland; September 23, 2022)
[online participation]
45. **Positivity bounds in the SMEFT** September 15, 2022
Plenary talk at “SMEFT-Tools 2022”
(Zurich, Switzerland; September 14 – 16, 2022)
44. **Complementarity between collider and gravitational wave searches for new physics** November 11, 2021
Plenary talk at “The 2021 International Workshop on the High Energy Circular Electron Positron Collider”
(Nanjing, China; November 8 – 12, 2021)
[online participation]
43. **Higgs phenomenology as a probe of sterile neutrinos** May 11, 2021

Plenary talk at “5th red LHC workshop”
(Madrid, Spain; May 10 – 12, 2021)
[online participation]

42. Searching new physics in rare B -meson decays into multiple muons

Plenary talk at “Beyond the flavour anomalies II”
(Durham, United Kingdom; April 20 – 22, 2021)
[online participation]

April 22, 2021

41. Where the new physics can be

Plenary talk at “ATLAS physics and performance week”
(CERN, Switzerland; November 16 – 20, 2020)
[online participation]

November 18, 2020

40. Electroweak baryogenesis at colliders

Plenary talk at “Institute on particle physics and cosmology”
(Warsaw, Poland; October 7 – 19, 2019)

October 18, 2019

39. A closer look to the shape of the Higgs potential with gravitational waves

Parallel talk at “DESY theory workshop”
(Hamburg, Germany; September 24 – 27, 2019)

September 26, 2019

38. Δ_{ACP} and new B meson decays

Plenary talk at “LHCb associateship meeting”
(Durham, United Kingdom; September 11 – 12, 2019)

September 12, 2019

37. Constraining four-fermion operators in rare top decays

Plenary talk at “LHC top working group meeting”
(CERN, Switzerland; May 28 – 29, 2019)

May 28, 2019

36. CP opportunities with ten billion b hadrons at CMS

Plenary talk at “Finding new physics with ten billion b hadrons”
(London, United Kingdom; May 22 – 23, 2019)

May 22, 2019

35. Probing new physics in top decays

Plenary talk at “HEFT 2019”
(Louvain-La-Neuve, Belgium; April 15 – 18, 2019)

April 17, 2019

34. Collider and gravitational wave probes of extended Higgs sectors with a low cutoff

Plenary talk at “Third Xmas workshop”
(Granada, Spain; December 18 – 19, 2018)

December 19, 2018

- 33. ✓ New physics in beam dump experiments**
Plenary talk at “New physics in kaon and beam-dump experiments”
(Birmingham, United Kingdom; December 3, 2018) December 3, 2018
- 32. ✓ Phase transitions & the LHC**
Plenary talk at “Probing baryogenesis via LHC and gravitational wave signatures ”
(Mainz, Germany; June 18 – 29, 2018) June 28, 2018
- 31. The electroweak phase transition in the standard model effective-field theory**
Plenary talk at “LISA CosmoWG workshop”
(Helsinki, Finland; June 11 – 15, 2018) June 13, 2018
- 30. Interplay between collider and dark matter searches in composite Higgs models**
Parallel talk at “Planck 2018”
(Bonn, Germany; May 21 – 25, 2018) May 24, 2018
- 29. On the behaviour of composite vectors breaking lepton flavour universality**
Plenary talk at “MC4BSM”
(Durham, United Kingdom; April 16 – 21, 2018) April 21, 2018
- 28. ✓ Theory view on ATLAS vector-like quark searches**
Plenary talk at “ATLAS heavy quark and top group workshop”
(CERN, Switzerland; March 5, 2018)
[online participation] March 5, 2018
- 27. ✓ The electroweak phase transition in a non-minimal standard-model effective-field theory**
Parallel talk at “IAS conference on high energy physics”
(Hong Kong, China; January 8 – 26, 2018) January 22, 2018
- 26. ✓ Vector-like quarks at future colliders and implications for composite Higgs models**
Plenary talk at “IAS workshop on high energy physics”
(Hong Kong, China; January 8 – 26, 2018) January 12, 2018
- 25. ✓ Beyond the minimal effective-field theory approach to electroweak baryogenesis**
Plenary talk at “Second Xmas workshop”
(Granada, Spain; December 20 – 21, 2017) December 21, 2017

- 24. Collider signals of models with radiatively-induced neutrino masses**
*Plenary talk at “Workshop on the Standard Model and beyond”
(Corfu, Greece; September 2 – 9, 2017)* September 6, 2017
- 23. Exceptional composite dark matter**
*Parallel talk at “DAvCo”
(Odense, Denmark; August 28 – September 1, 2017)* August 31, 2017
- 22. Extended composite Higgs models**
*Plenary talk at “Higgs Hunting 2017”
(Paris, France; July 24 – 26, 2017)* July 25, 2017
- 21. A light sneutrino rescues the light stop**
*Plenary talk at “The TeV scale: a threshold to new physics?”
(Mainz, Germany; June 12 – July 7, 2017)* July 7, 2017
- 20. Composite Higgs models**
*Plenary talk at “HEFT 2017”
(Durham, United Kingdom; May 22 – 24, 2017)* May 22, 2017
- 19. Direct dark matter versus mediator searches at 100 TeV**
*Plenary talk at “1st FCC physics workshop”
(CERN, Switzerland; January 16 – 20, 2017)* January 20, 2017
- 18. The MSSM faces the LHC run 2**
*Plenary talk at “First Xmas workshop”
(Granada, Spain; December 21, 2016)* December 21, 2016
- 17. Exotic searches for new vector-like quarks**
*Plenary talk at “BSM faces LHC run-2 realities”
(Hamburg, Germany; September 12 – 16, 2016)* September 16, 2016
- 16. Composite dark matter**
*Plenary talk at “Effective field theories as discovery tools”
(Mainz, Germany; August 22 – September 9, 2016)* September 5, 2016
- 15. Observable effects of general new scalar particles**
*Parallel talk at “Physics at the terascale”
(Hamburg, Germany; November 17 – 18, 2015)* November 17, 2015
- 14. Composite Higgs models and dark matter**
*Plenary talk at “Composite Higgs program at Fermilab”
(Chicago, United States; November 8 – 14, 2015)* November 13, 2015

- 13. Interplay between dark matter models and LHC data**
Parallel talk at “DESY theory workshop: Physics at the LHC and beyond”
(Hamburg, Germany; September 29 – October 02, 2015)
- 12. Collider signatures of LNV Higgs sectors**
Parallel talk at “BLV 2015”
(Amherst, United States; April 26 – 30, 2015)
- 11. Searches for heavy gluons**
Plenary talk at “Workshop on new physics searches in the top quark sector at the LHC”
(Braga, Portugal; March 5 – 7, 2015)
- 10. LNV in non-standard Higgs sectors**
Parallel talk at “DISCRETE 2014”
(London, United Kingdom; December 2 – 6, 2014)
- 9. Leptophilic physics at the LHC**
Parallel talk at “VI CPAN days”
(Sevilla, Spain; October 20 – 22, 2014)
- 8. Distinguishing LNV scalars at the LHC**
Parallel talk at “Scalars 2013”
(Warsaw, Poland; September 12 – 16, 2013)
- 7. Top and bottom partners in composite Higgs models at the LHC**
Parallel talk at “LHCP conference 2013”
(Barcelona, Spain; May 13 – 18, 2013)
- 6. Dark matter from composite Higgs models**
Plenary talk at “8th MultiDark workshop”
(Granada, Spain; April 17 – 19, 2013)
- 5. Searching for LNV scalars at the LHC**
Parallel talk at “IV CPAN days”
(Granada, Spain; November 26 – 28, 2012)
- 4. New Higgs production mechanisms in composite Higgs models**
Parallel talk at “BOOST 2012”
(Valencia, Spain; July 23 – 27, 2012)
- 3. New Higgs production mechanisms in composite Higgs models**

*Plenary talk at “Higgs hunting 2012”
(Orsay, France; July 18 – 20, 2012)*

2. New Higgs production mechanisms in composite Higgs models

*Parallel talk at “Workshop on strongly coupled physics beyond the Standard Model”
(Trieste, Italy; January 16 – 24, 2012)*

January 20, 2012

1. New vectorlike production mechanisms at the LHC

*Parallel talk at “III CPAN days”
(Barcelona, Spain; November 2 – 4, 2011)*

November 3, 2011

INVITED SEMINARS

18. The landscape of effective field theories

*Oklahoma State University
(Oklahoma, United States)
[online participation]*

November 2, 2023

17. Restrictions on the RG flow of effective field theories

*KIAS
(Seoul, South Korea)*

June 1, 2023

16. Positivity bounds in the Standard Model effective field theory

*IFIC
(Valencia, Spain)*

May 13, 2022

15. The quantum structure of the Standard Model effective field theory

*Queen Mary University of London
(London, United Kingdom)*

February 17, 2022

14. Advances in the quantum structure of the SMEFT

*Glasgow University
(Glasgow, United Kingdom)*

January 26, 2022

13. Effective field theory of the standard model with right-handed neutrinos

*HEP-Cosmo webinar series
(India)
[online participation]*

September 18, 2020

- | | |
|--|-------------------|
| 12. Effective field theory of the standard model with right-handed neutrinos
<i>University of Stavanger</i>
<i>(Stavanger, Norway)</i>
<i>[online participation]</i> | April 29, 2020 |
| 11. Electroweak baryogenesis in extended Higgs sectors
<i>Charles University</i>
<i>(Prague, Czech Republic)</i> | October 11, 2019 |
| 10. Composite scalar WIMPs
<i>University of Southampton</i>
<i>(Southampton, United Kingdom)</i> | October 19, 2018 |
| 9. Electroweak phase transition in the standard model effective field theory
<i>University of Bonn</i>
<i>(Bonn, Germany)</i> | May 18, 2018 |
| 8. Signals of the electroweak phase transition in the standard model effective field theory
<i>University of Sussex</i>
<i>(Brighton, United Kingdom)</i> | March 19, 2018 |
| 7. Composite scalar WIMPs
<i>Weizmann Institute</i>
<i>(Rehovot, Israel)</i> | February 21, 2018 |
| 6. Is the Higgs a pseudo-Nambu-Goldstone boson?
<i>University of Bern</i>
<i>(Bern, Switzerland)</i> | March 24, 2017 |
| 5. Non-minimal composite Higgs models with dark matter
<i>University of Durham</i>
<i>(Durham, United Kingdom)</i> | February 23, 2017 |
| 4. Predictive models of dark matter
<i>Universidad de Granada</i>
<i>(Granada, Spain)</i> | October 18, 2016 |
| 3. Collider signals of new quarks and vector bosons
<i>University of Dortmund</i>
<i>(Dortmund, Germany)</i> | January 19, 2016 |
| 2. Stretching the LHC discovery power | October 28, 2014 |

University of Zurich
(Zurich, Switzerland)

1. Constraining new physics at the LHC

October 27, 2013

ETH Zurich
(Zurich, Switzerland)

OUTREACH ACTIVITIES

Student engagement

September 2018

Orkney, United Kingdom

Programm entitled *Modelling the invisible*, addressed to tens of primary and secondary schools all around the Orkney islands to understand better the goals of particle physics. Promoted by Durham University.

Public engagement

October 2017

Bilbao, Spain

Programm entitled *Science in action*, addressed to the general public to assist science exhibitions. Promoted by the CSIC, Lilly Foundation, ICMAT, RSEF, RSEQ, SEA, SEBBM, SGE and UNED.

Student engagement

November 2012 – June 2013

Granada, Spain

Programm entitled *Searching for the Higgs boson in four lepton events*, addressed to secondary schools to take their first steps in research. Promoted by the PIISA project.

Besides, I have given tens of dedicated popular talks.

LIST OF PUBLICATIONS

My list of publications, including citations, can be found in the **inSPIRE** database under the command `find a M.Chala.1 and not cn atlas`. Excluding my ATLAS papers, my [total number of citations is 6084](#), [h-index is 37](#).

<i>Title / Authors / Journal reference</i>	<i>arXiv number</i>
61. The landscape of composite Higgs models <i>Mikael Chala and Renato Fonseca</i> To be submitted.	2309.10635
60. Constraints on anomalous dimensions from the positivity of the S-matrix <i>Mikael Chala</i> Phys.Rev.D 108 (2023) 1, 015031.	2301.09995

- 59. Towards the renormalisation of the Standard Model effective field theory to dimension eight: Bosonic interactions II** 2205.03301
Supratim Das Bakshi, Mikael Chala, Álvaro Díaz Carmona and Guilherme Guedes
Eur.Phys.J.Plus 137 (2022) 8, 973.
- 58. Cosmology with the Laser Interferometer Space Antenna** 2204.05434
LISA Cosmology Working Group
Submitted.
- 57. New Higgs decays to axion-like particles** 2203.14984
Anke Biekötter, Mikael Chala and Michael Spannowsky
Phys.Lett.B 834 (2022) 137465.
- 56. A Green's basis for the bosonic SMEFT to dimension 8** 2112.12724
Mikael Chala, Álvaro Díaz Carmona and Guilherme Guedes
JHEP 05 (2022) 138.
- 55. Positivity bounds in the Standard Model effective field theory beyond tree level** 2110.01624
Mikael Chala and Jose Santiago
Phys.Rev.D 105 (2022) 11, L111901.
- 54. Review on Goldstone dark matter**
Mikael Chala
Eur.Phys.J.ST 231 (2022) 7, 1315-1323
- 53. Towards the renormalisation of the Standard Model effective field theory to dimension eight: Bosonic interactions I** 2106.05291
Mikael Chala, Guilherme Guedes, Maria Ramos and Jose Santiago
SciPost Phys. 11 (2021) 065.
- 52. Neutrino masses in the standard model effective field theory** 2104.08248
Mikael Chala and Arsenii Titov
Phys.Rev.D 104 (2021) 3, 035002.
- 51. Running in the ALPs** 2012.09017
Mikael Chala, Guilherme Guedes, Maria Ramos and Jose Santiago
Eur.Phys.J.C 81 (2021) 181.
- 50. The effective field theory of low scale see-saw at colliders** 2007.00673
Anke Biekötter, Mikael Chala and Michael Spannowsky
Eur.Phys.J.C 80 (2020) 743.
- 49. One-loop running of dimension-six Higgs-neutrino operators and implications of a large neutrino dipole moment** 2006.14596
Mikael Chala and Arsenii Titov
JHEP 09 (2020) 188.

- 48. Effective field theory for vector-like leptons and its collider signals** 2005.09655
Mikael Chala, Pawel Kozow, Maria Ramos and Arsenii Titov
Phys.Lett. B (2020) 135752.
- 47. Novel flavour-changing neutral currents in the top quark sector** 2005.09594
Nuno Castro, Mikael Chala, Ana Peixoto and Maria Ramos
JHEP 10 (2020) 038.
- 46. One-loop matching in the SMEFT extended with a sterile neutrino** 2001.07732
Mikael Chala and Arsenii Titov
JHEP 05 (2020) 139.
- 45. Detecting gravitational waves from cosmological phase transitions with LISA** 1910.13125
Chiara Caprini, Mikael Chala et al.
JCAP 2003 (2020) no.03, 024.
- 44. Higgs phenomenology as a probe of sterile neutrinos** 1909.04665
Jonathan M. Butterworth, Mikael Chala, Christoph Englert, Michael Spannowsky and Arsenii Titov
Phys.Rev. D100 (2019) no.11, 115019
- 43. Novel B -decay signatures of light scalars at high energy facilities** 1907.13151
Andrew Blance, Mikael Chala, Maria Ramos, Michael Spannowsky
Phys.Rev. D100 (2019) no.11, 115015
- 42. FCC-ee: The lepton collider: future circular collider conceptual design report volume 2**
FCC Collaboration
Eur.Phys.J.ST 228 (2019) no.2, 261-623.
- 41. FCC-hh: The hadron collider: Future circular collider conceptual design report volume 3**
FCC Collaboration
Eur.Phys.J.ST 228 (2019) no.4, 755-1107.
- 40. HE-LHC: The High-Energy Large Hadron Collider**
FCC Collaboration
Eur. Phys. J. ST 228 (2019) no.5, 1109-1382.
- 39. FCC physics opportunities: Future circular collider conceptual design report volume 1**
FCC Collaboration
Eur.Phys.J.C 79 (2019) no.6, 474.

- 38. Probes of the Standard Model effective field theory extended with a right-handed neutrino** 1905.11375
Julien Alcaide, Shankha Banerjee, Mikael Chala and Arsenii Titov
 JHEP 1908 (2019) 031.
- 37. Mapping the shape of the scalar potential with gravitational waves** 1905.00911
Mikael Chala, Valentin V. Khoze, Michael Spannowsky, Philip Waite
 Int.J.Mod.Phys. A34 (2019) no.33, 1950223.
- 36. Interplay between collider searches for vector-like quarks and dark matter searches in composite Higgs models**
Mikael Chala, Ramona Gröber and Michael Spannowsky
 Int.J.Mod.Phys. A34 (2019) no.13n14, 1940011.
- 35. ΔA_{CP} within the standard model and beyond** 1903.10490
Mikael Chala, Alexander Lenz, Aleksey V. Rusov and Jakub Scholtz.
 JHEP 1907 (2019) 161.
- 34. Searching new physics in rare B -meson decays into multiple muons** 1902.10156
Mikael Chala, Ulrik Egede and Michael Spannowsky.
 Eur.Phys.J. C79 (2019) no.5, 431.
- 33. Opportunities in flavour physics at the HL-LHC and HE-LHC** 1812.07638
A. Cerri, V.V. Gligorov, S. Malvezzi, J. Martin Camalich, J. Zupan et al
 CERN Yellow Rep. Monogr. 7 (2019) 867-1158.
- 32. Gravitational wave and collider probes of extended Higgs sectors with a low cutoff** 1812.01901
Mikael Chala, Maria Ramos and Michael Spannowsky
 Eur. Phys. J. C79 (2019) no.2, 156.
- 31. Constraining four-fermion operators using rare-top decays** 1809.09624
Mikael Chala, Jose Santiago, Michael Spannowsky
 JHEP 1904 (2019) 014.
- 30. Top quark FCNCs in extended Higgs sectors** 1806.02836
Shankha Banerjee, Mikael Chala and Michael Spannowsky.
 Eur.Phys.J. C78 (2018) no.8, 683.
- 29. On the behaviour of composite resonances breaking lepton flavour universality** 1803.02364
Mikael Chala and Michael Spannowsky.
 Phys. Rev. D98 (2018) 035-010

- 28. Signals of the electroweak phase transition at colliders and gravitational wave observatories** 1802.02168
Mikael Chala, Germano Nardini and Claudius Krause.
 JHEP 1807 (2018) 062.
- 27. Searches for vector-like quarks at future colliders and implications for composite Higgs models with dark matter** 1801.06537
Mikael Chala, Ramona Gröber and Michael Spannowsky.
 JHEP 1803 (2018) 040.
- 26. LHC signals of radiatively-induced neutrino masses and implications for the Zee-Babu model** 1710.05885
Julien Alcaide, Mikael Chala and Arcadi Santamaria.
 Phys.Lett. B779 (2018) 107-116.
- 25. Direct bounds on heavy top-like quarks with standard and exotic decays** 1705.03013
Mikael Chala.
 Phys. Rev. D96 (2017) 015-028.
- 24. Exceptional Composite Dark Matter** 1704.07388
Guillermo Ballesteros, Adrian Carmona and Mikael Chala.
 Eur.Phys.J. C77 (2017) no.7, 468.
- 23. Minimally extended SILH** 1703.10624
Mikael Chala, Gauthier Durieux, Christophe Grojean, Leonardo de Lima and Oleksii Matsedonskyi
 JHEP 1706 (2017) 088.
- 22. A light sneutrino rescues the light stop** 1702.07359
Mikael Chala, Antonio Delgado, Germano Nardini and Mariano Quirós
 JHEP 1704 (2017) 097
- 21. Confronting SUSY models with LHC data via electroweakino production** 1610.03822
Chiara Arina, Mikael Chala, Víctor Martín-Lozano and Germano Nardini.
 JHEP 1612 (2016) 149
- 20. Physics at a 100 TeV pp collider: beyond the Standard Model phenomena** 1606.00947
T. Golling, M. Hance, P. Harris, M.L. Mangano et al.
 CERN Yellow Report (2017) no. 3, 441-634
- 19. A unified explanation for dark matter and electroweak baryogenesis with direct detection and gravitational wave signatures** 1605.08663
Mikael Chala, Germano Nardini and Ivan Sobolev
 Phys. Rev. D94 (2016) 055-006

- 18. Deciphering the CP nature of the 750 GeV resonance** 1604.02029
M. Chala, C. Grojean, M. Riembau and T. Vantalon
Phys.Lett. B760 (2016) 220-227
- 17. Tricking Landau-Yang: How to obtain the diphoton excess from a vector resonance** 1512.06833
M. Chala, M. Duerr, F. Kahlhoefer and K. Schmidt-Hoberg
Phys.Lett. B755 (2016) 145-149
- 16. Renormalization Group Constraints on New Top Interactions from Electroweak Precision Data** 1507.00757
Jorge de Blas, Mikael Chala and Jose Santiago
JHEP 1509 (2015) 189
- 15. Composite Dark Sectors** 1504.00332
Adrián Carmona and Mikael Chala
JHEP 1506 (2015) 105
- 14. Constraining Dark Sectors with Monojets and Dijets** 1503.05916
M. Chala, F. Kahlhoefer, M. McCullough, G. Nardini and K. Schmidt-Hoberg
JHEP 1507 (2015) 089
- 13. Observable Effects of General New Scalar Particles** 1412.8480
J. Blas, M. Chala, M. Pérez-Victoria and J. Santiago.
JHEP 1504 (2015) 078
- 12. Collider limits on leptophilic interactions** 1411.7394
F. del Águila, M. Chala, J. Santiago and Y. Yamamoto.
JHEP 1503 (2015) 059
- 11. The Elusive Gluon** 1411.1771
Mikael Chala, José Juknevich, Gilad Perez and José Santiago.
JHEP 1501 (2015) 092
- 10. From Tevatron's top and lepton-based asymmetries to the LHC** 1401.2443
A. Carmona, M. Chala, A. Falkowski, S. Khatibi, M. Najafabadi et al.
JHEP 1407 (2014) 005
- 9. Lepton Number Violation and Scalar Searches at the LHC** 1311.2950
Francisco del Águila, Mikael Chala, Arcadi Santamaría and José Wudka
Acta Phys. Polon. B44 (2013) 1001-1011
- 8. LHC bounds on Lepton Number Violation mediated by doubly and singly-charged scalars** 1311.1510
Francisco del Águila and Mikael Chala
JHEP 1403 (2014) 027

- 7. Global Constraints on Lepton-Quark Contact Interactions** 1307.5068
Jorge de Blas, Mikael Chala and José Santiago
 Phys. Rev D88 (2013) 095-011
- 6. Discriminating between lepton number violating scalars using events with four and three charged leptons at the LHC** 1305.3904
Francisco del Aguila, Mikael Chala, Arcadi Santamaría and José Wudka
 Phys.Lett. B725 (2013) 310-315
- 5. $Hb\bar{b}$ production in Composite Higgs Models** 1305.1940
Mikael Chala and José Santiago
 Phys. Rev. D88 (2013) 035-010
- 4. Searches for New Vector Like Quarks: Higgs Channels** 1302.0270
Anupama Atre, Mikael Chala, José Santiago
 JHEP 1305 (2013) 099
- 3. $h \rightarrow \gamma\gamma$ excess and Dark Matter from Composite Higgs Models** 1210.6208
Mikael Chala
 JHEP 1301 (2013) 122
- 2. New Higgs Production Mechanism in Composite Higgs Models** 1205.2378
Adrián Carmona, Mikael Chala, José Santiago
 JHEP 1207 (2012) 049
- 1. Single Vectorlike Quark Production at the LHC** 1110.5914
R. Barceló, A. Carmona, M. Chala, M. Masip, J. Santiago
 Nucl. Phys. B857 (2012) 172-184
- Proceedings*
-
- Theory Techniques for Precision Physics – Snowmass 2021**
TF06 Topical Group Report 2209.10639
Radja Boughezal, Zoltan Ligeti, Wolfgang Altmannshofer, Supratim Das Bakshi et al.
 Proceedings of Snowmass 2021.
- Theoretical developments in the SMEFT at dimension-8 and beyond** 2203.06771
Simone Alioli, Radja Boughezal, Weiguang Cao, Mikael Chala et al.
 Proceedings of Snowmass 2021.
- A critical assessment of the status of LHC searches for new physics**
Mikael Chala
 PoS CORFU2017 (2018) 047

Four and two-lepton signals of leptophilic gauge interactions at large colliders	1505.00799
<i>F. del Aguila, M. Chala, J. Santiago and Y. Yamamoto</i> PoS CORFU2014 (2015) 109	
Boosted objects and jet substructure at the LHC	1311.2708
<i>A. Altheimer, A. Arce, L. Asquith, J. Backus Mayes et al.</i> BOOST Proceedings 2012	
Distinguishing between LNV scalars at the LHC	1307.0510
<i>Francisco del Aguila, Mikael Chala, Arcadi Santamaría and José Wudka</i> EPJ Web Conf. 60 (2013) 17002	
Physics of the Interplay Between the Top Quark and the Higgs	1303.0989
<i>Mikael Chala and José Santiago</i> J. Phys. Conf. Ser. 452 (2013) 012008	
Physics at TeV Colliders New Physics Working Group Report	1203.1488
<i>G. Brooijmans, B. Gripaios, F. Moortgat, J. Santiago et al.</i> Les Houches Proceedings 2011	

BOOKS

Quantum physics for Alice	June 2017
<i>Mikael Chala</i> ISBN 13: 978-84-946742-2-8, 224 pages, in Spanish. Publisher: Laetoli.	
Collider signatures of a non-standard Higgs sector	October 2014
<i>Mikael Chala</i> ISBN 13: 978-84-9083-125-0, 200 pages, in English. Publisher: Universidad de Granada.	

JOURNAL PEER-REVIEWING

(Journals in which I served as Editor are labeled by ♠)

European Physics Journal Plus	2022 – today
Modern Physics Letters A, Universe ♠	2020 – today
International Journal of Modern Physics A	2019 – today
Physical Review Letters	2018 – today

Journal of High Energy Physics,
European Physical Journal C, Physics Letters B 2017 – today

Physical Review D 2014 – today

REFeree FOR FUNDING AGENCIES

Consejo Nacional de Ciencia, Tecnología e
Innovación April 2022
(Peru)

Agence Nationale de la Recherche (France) May 2021
(France)

Agencia Estatal de Investigación April 2021
(Spain)

National Research Foundation June 2017
(South Africa)

THESIS COMMITTEES

Carlos Faubel Alamá July 28, 2022
Universitat de València
Title: *New scalars at the origin of dark matter and anomalies in magnetic moments.* Committee members: Nuria Rius (president), Mikael Chala (secretary), Jose Wudka (vocal).

Javier Alonso González December 14, 2021
Universidad Autónoma de Madrid
Title: *Phenomenological Aspects Of The Minimal Linear σ Model And Of Its Extensions.* Committee members: José Ramón Espinosa (president), Mikael Chala (secretary), Ramona Gröber (vocal).

Tal Roelof van Daalen March 23, 2021
Universitat Autònoma de Barcelona
Title: *Searches for Heavy Top Partners with the ATLAS Detector and Irradiation Studies of the Tile Hadronic Calorimeter.* Committee members: Martine Jeanne Bosman (president), Mikael Chala (secretary), Oliver Stelzer-Chilton (vocal).

I have also participated as *external referee* for one PhD candidate.

GRANTS

Ramón y Cajal

November 2020 – today

Universidad de Granada (Granada, Spain)

Senior fellowship. Funded by the Spanish Ministry of Economy, Industry and Competitivity under the National Program of R & D & I.

Success rate: ~ 8 %. [Score: 9/206](#).

Juan de la Cierva

November 2019 – October, 2020

Universidad de Granada (Granada, Spain)

Junior fellowship. Funded by the Spanish Ministry of Economy, Industry and Competitivity under the National Program of R & D & I.

Success rate: ~ 17 %. [Score: 1/76](#).

Newton International Fellowship

November 2017 – October, 2019

Durham University (Durham, United Kingdom)

Postdoctoral fellowship. Funded by the Royal Society under the Newton International Fellowship program.

Success rate: ~ 10 %.

FPU grant

December 2011 – October, 2014

Universidad de Granada (Granada, Spain)

Doctoral grant. Advisors: Prof. Francisco del Águila and Dr. José Santiago. Funded by the Spanish Ministry of Education and Culture under the FPU program.

FPI grant

August – November 2011

Universidad de Granada

Doctoral grant. Advisor: Dr. José Santiago. Funded by the Spanish Ministry of Economy, Industry and Competitivity under the FPI program.

Collaboration grant

September 2009 – June 2010

Universidad de Granada

Undergraduate grant. Advisor: Dr. Bert Janssen. Funded by the Spanish Ministry of Education and Culture under the Becas de Colaboración program.

Initiation to research grant

May 2009 – May 2010

Universidad de Granada

Undergraduate grant. Advisor: Dr. Bert Janssen. Funded by the Universidad de Granada under the Becas de Iniciación a la investigación program.

JAIntro grant

July – September 2009

UAM/CSIC

Undergraduate grant. Advisors: Prof. Tomás Ortín and Dr. Patrick Meesen. Funded by the CSIC under the JAEIntro program.

PRIZES AND AWARDS

Universidad de Granada

July 2017

Granada (Spain)

Extraordinary prize to the best PhD thesis in Science defended in 2013-2014 (out of 93).

DESY

December 2015

Hamburg (Germany)

Individual performance bonus in recognition of the exceptionally good work done in 2015.

Royal Spanish Mathematical Society

March 2005

Santiago de Compostela (Spain)

Bronze medal in the national phase of the Spanish *National Mathematical Olympiad* organized by the Royal Spanish Mathematical Society.

Royal Spanish Mathematical Society

March 2005

Córdoba (Spain)

Second prize in the local phase of the Spanish *National Mathematical Olympiad* organized by the Royal Spanish Mathematical Society.

Outreach

Science in Action

July 2017

Ermua (Basque Country)

Finalist of the XVIII edition of the international contest *Science in action* organized by CSIC, Lilly Foundation, ICMAT, RSEF, RSEQ, SEA, SEBBM, SGE and UNED in the category of *Physics and society*, by the proposal: *A new way to look at electromagnetic waves*.

**Spanish National Center for Particle,
Astroparticle and Nuclear Physics**

October 2014

Sevilla (Spain)

First prize in the *V Outreach Contest* organized by the spanish CPAN in the category *Outreach Articles*, by the article: *Neutrino masses: where is our Neptune?*

MEMBER OF INTERNATIONAL COLLABORATIONS

FCC Collaboration

December 2018 – present

LISA Constortium

July 2018 – present

ATLAS Collaboration

November 2019 – January 2022

Qualification task:

A shallow-copy approach to obtaining jets with different calibrations, supervised by Prof. Teng Jian Khoo.

INSTITUTIONAL CHARGES

Dpto. Física Teórica y del Cosmos

January 2020 – today

Universidad de Granada

Representative in the teaching commission of Mathematics of the Universidad de Granada.

Dpto. Física Teórica y del Cosmos

February 2020 – June 2021

Universidad de Granada

Responsible for the *organization of seminars* at the Dpto. Física Teórica y del Cosmos of the Universidad de Granada.

Institute of particle physics phenomenology

June 2018 – May 2019

University of Durham

Responsible for the *organization of seminars* at the Institute of particle physics phenomenology of the University of Durham.

Dpto. Física Teórica y del Cosmos

January 2011 – June 2012

Universidad de Granada

Member of the *Steering Committee* of the Dpto. Física Teórica y del Cosmos of the Universidad de Granada.

PARTICIPATION IN FUNDED PROJECTS

Testing the quantum structure of the Standard

Model effective field theory

2023 – 2024

International level

PI: Mikael Chala. Number of members: 6. Funded by The Royal Society under the Newton international fellowships alumni programme. Total amount: 6,000 £.

The Quantum Structure of the Standard Model

Effective Field Theory

2023 – 2025

National level

PI: Mikael Chala. Number of members: 1. Funded by the Spanish ministry of science under the “Consolidación Investigadora” programme. Total amount: 186,000 €.

Effective Field Theories: formal aspects, and phenomenology at the Large Hadron Collider (LHC) and in flavor factories

2022 – 2025

Regional level

PI: Javier Fuentes Martín. Number of members: 8. Funded by Junta de Andalucía under the regional programme of R & D & I. Total amount: 164,864 €.

**Understanding better the Standard Model
effective field theory**

2022 – 2023

International level

PI: Mikael Chala. Number of members: 5. Funded by The Royal Society under the Newton international fellowships alumni programme. Total amount: 5,805.35 £.

**Comprehensive study of non-minimal effective
field theories**

2022 – 2024

International level

PI: Michael Spannowsky and Abdelhak Djouadi. Number of members: 12. Funded by The Royal Society under the International Exchange programme. Total amount: 12,000 €.

**Dark matter, Higgs physics and
effective field theories**

2022 – 2025

National level

PI: Abdelhak Djouadi. Number of members: 2. Funded by the Spanish ministry of science under the national programme of R & D & I. Total amount: 89,540 €.

Análisis de neutrinos y nueva física

2021 – 2024

Regional level

PI: Roberto Vega-Morales and Bruno Zamorano. Number of members: 5. Funded by the University of Granada under the Programa Operativo FEDER Andalucía. Total amount: 35,000 €.

**Searching for axion-like particles combining
collider, astrophysical and low-energy data**

2020 – 2022

International level

PI: Mikael Chala. Number of members: 4. Funded by The Royal Society under the Newton international fellowships alumni programme. Total amount: 6,000 £.

**Precise and flavour computations in the
standard model and beyond**

2020 – 2023

International level

PI: Roberto Pittau and Elvira Gámiz. Number of members: 5. Funded by Spanish ministry of science under the national programme of R & D & I. Total amount: 142,780 €.

**Radiative corrections in the Standard Model
effective field theory and implications at
colliders**

2020 – 2022

International level

PI: Mikael Chala. Number of members: 5. Funded by The Royal Society under the Newton international fellowships alumni programme. Total amount: 6,000 £.

Besides those, I have participated as *collaborator* in 7 Spanish, 7 Portuguese, 1 Norwegian and 1 European projects since 2010.