

Pablo Martínez-Miravé

CURRICULUM VITAE



CONTACT INFORMATION

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CURRENT POSITION & EDUCATION

October 2023 - present	Postdoctoral Fellow at Niels Bohr Institute (NBI) University of Copenhagen
October 2019 - September 2023	PhD Candidate at University of Valencia FPU Fellowship for PhD studies Thesis title: Neutrino properties from the laboratory and the cosmos Graded excellent cum laude and International Mention
October 2018 - October 2019	Master in Advanced Physics (Specialised in Theoretical Physics) University of Valencia Fellowship for Introduction to Research at IFIC (9 months) Extraordinary award of the master
September 2014 - July 2018	Bachelor studies in Physics University of Valencia Extraordinary award of the bachelor

SECONDMENTS IN FOREIGN INSTITUTIONS

November 2022	Niels Bohr Institute (NBI) Copenhagen, Denmark. EuCAPT International Exchange Award
September 2022	Centro de Física Teórica de Partículas (CFTP), Instituto Superior Técnico (IST) Lisbon, Portugal. COST Action CA18108 Short-Term Scientific Mission
September 2021 - December 2021	Max Planck Institute für Kernphysik (MPIK) Heidelberg, Germany
October 2019	Fermilab National Accelerator Laboratory Batavia, Illinois, USA
April 2019	Fermilab National Accelerator Laboratory Batavia, Illinois, USA

PUBLICATIONS

In the field of particle astrophysics

Authors' order is set according to their relative contribution, following common practices in the field

The Unknowns of the Diffuse Supernova Neutrino Background Hinder New Physics Searches
M. MacDonald, **P. Martínez-Miravé**, I. Tamborra
e-Print: [2409.16367](#) [astro-ph.HE]

Diffuse Neutrino Background from Magnetorotational Stellar Core Collapses

P. Martínez-Miravé, I. Tamborra, M. Á. Aloy, M. Obergaulinger

e-Print: [2409.09126](#) [astro-ph.HE]

The next galactic supernova can uncover mass and couplings of particles decaying to neutrinos

B. Telalovic, D. F. G. Fiorillo, **P. Martínez-Miravé**, E. Vitagliano, M. Bustamante

e-Print: [2406.15506](#) [hep-ph]

The Sun and core-collapse supernovae are leading probes of the neutrino lifetime

P. Martínez-Miravé, I. Tamborra, M. Tórtola

JCAP 05 (2024) 002 • e-Print: [2402.00116](#) [astro-ph.HE]

In the field of particle physics

Authors listed in alphabetical order, following common practices in the field.

Effects of Neutrino-Ultralight Dark Matter Interaction on the Cosmic Neutrino Background

P. Martínez-Miravé, Y. F. Perez-Gonzalez, M. Sen

Phys.Rev.D 110 (2024) 5, 055005 • e-Print: [2406.01682](#) [hep-ph]

Neutrino CPT violation in the solar sector

G. Barenboim, **P. Martínez-Miravé**, C. A. Ternes, M. Tórtola

Phys.Rev.D 108 (2023) 3, 035039 • e-Print: [2305.06384](#) [hep-ph]

Non-unitary three-neutrino mixing in the early Universe

S. Gariazzo, **P. Martínez-Miravé**, O. Mena, S. Pastor, M. Tórtola

JCAP 03 (2023) 046 • e-Print: [2211.10522](#) [hep-ph]

Solar electron antineutrino flux: Revisiting bounds on neutrino magnetic moments and solar magnetic field

E. Akhmedov, **P. Martínez-Miravé**

JHEP 10 (2022) 144 • e-Print: [2207.04516](#) [hep-ph]

Cosmology-friendly time-varying neutrino masses through the sterile portal

G.-Y. Huang, M. Lindner, **P. Martínez-Miravé**, M. Sen

Phys.Rev.D 106 (2022) 3, 033004 • e-Print: [2205.08431](#) [hep-ph]

Nonstandard interactions from the future neutrino solar sector

P. Martínez-Miravé, S. Molina Sedgwick, M. Tórtola

Phys.Rev.D 105 (2022) 3, 035004 • e-Print: [2111.03031](#) [hep-ph]

Signatures of primordial black hole dark matter at DUNE and THEIA

V. De Romeri, **P. Martínez-Miravé**, M. Tórtola

JCAP 10 (2021) 051 • e-Print: [2106.05013](#) [hep-ph]

Cosmological radiation density with non-standard neutrino-electron interactions

P. F. de Salas, S. Gariazzo, **P. Martínez-Miravé**, S. Pastor, M. Tórtola

Phys.Lett.B 820 (2021) 136508 • e-Print: [2105.08168](#) [hep-ph]

Signatures of ultralight dark matter in neutrino oscillation experiments

A. Dev, P. A. N. Machado, **P. Martínez-Miravé**

JHEP 01 (2021) 094 • e-Print: [2007.03590](#) [hep-ph]

2020 global reassessment of the neutrino oscillation picture

P. F. de Salas, D. V. Forero, S. Gariazzo, **P. Martínez-Miravé**, O. Mena, C. A. Ternes, M. Tórtola, J. W. F. Valle

JHEP 02 (2021) 071 • e-Print: [2006.11237](#) [hep-ph]

Sterile neutrinos with altered dispersion relations revisited

G. Barenboim, **P. Martínez-Miravé**, C. A. Ternes, M. Tórtola

JHEP 03 (2020) 070 • e-Print: [1911.02329](#) [hep-ph]

Selected publications as part of Collaborations:

Quantum gravity phenomenology at the dawn of the multi-messenger era - A review

A. Addazi et al. • Prog.Part.Nucl.Phys. 125 (2022) 103948 • e-Print: [2111.05659](#) [hep-ph]

Active contribution to several subsections on the section on Phenomenology of quantum gravity.

Synergy between cosmological and laboratory searches in neutrino physics: a white paper

K. Abazajian et al. • Physics of the Dark Universe (2023) 101333 • e-Print: [2203.07377](#) [hep-ph]

Active contribution contributed to the section on Laboratory probes of neutrino properties.

WORKSHOPS, CONFERENCES AND SEMINARS

Hyperlinks to the contribution material provided when available.

MITP Topical Workshop.

Towards the Detection of Diffuse Supernova Neutrinos: What will we see? What can we learn?

16-20 September 2024, Mainz Institute for Theoretical Physics, Johannes Gutenberg University Mainz, Mainz (Germany)

Title: [The Diffuse Supernova Neutrino Background from Magnetorotational Core Collapses](#)

Colloquium at Physics Department at Universidad Católica del Norte

12 September 2024, online - Physics Department at Universidad Católica del Norte, Antofagasta (Chile)

Title: (Some) Neutrino lessons from the next galactic supernova

YOUNGST@RS - Interacting dark sectors in astrophysics, cosmology, and the lab

6 - 9 November, 2023, online - Mainz Institute for Theoretical Physics, Johannes Gutenberg University

Contribution: Invited talk - [Neutrinos meet ultralight dark matter \(in the lab\)](#)

18th International Conference on Topics in Astroparticle and Underground Physics (TAUP 2021)

28 August - 1 September, 2023, Vienna (Austria)

Contribution: Parallel Talk • [Neutrino decoupling in standard and non-standard scenarios](#)

Contribution: Parallel Talk • [Testing CPT invariance with the neutrino solar sector](#)

Fourth Annual conference “COST - Quantum Gravity Phenomenology in the Multimessenger Approach”

10 - 14 July, 2022, Rijeka (Croatia)

Contribution: Plenary Talk • [Testing CPT with the solar neutrino sector](#)

CERN Neutrino Platform Pheno Week 2023

13 - 17 March, 2023, CERN (Switzerland)

Title: [A solar electron antineutrino flux from neutrino magnetic moments](#)

TUM Jorunal Club/Seminar.

21 November 2022, online, Technische Universität München, Munich (Germany)

Title: [A solar antineutrino flux from neutrino magnetic moments](#)

NBIA Astroparticle Seminar.

07 November 2022, Niels Bohr Institute, Copenhagen (Denmark)

Title: [Terrestrial and cosmological probes of non-standard neutrino interactions](#)

CFTP Seminar.

22 September 2022, Instituto Superior Tecnico, Lisbon (Portugal)

Title: [Solar Neutrinos. Shining light on neutrino properties.](#)

Third Annual conference “COST - Quantum Gravity Phenomenology in the Multimessenger Approach”

12 - 15 July, 2022, Naples (Italy)

Contribution: Plenary Talk • [Phenomenology of time-varying neutrino masses](#)

9th Workshop on Flavour Symmetries and Consequences in Accelerators and Cosmology (FLASY 2022)

27 June - 01 July, 2022, Lisbon (Portugal)

Contribution: Parallel Talk • [Cosmology-friendly time-varying neutrino masses and beta decay experiments](#)

Invited talk for IFIC Scientific Days of the Research line: Neutrinos and Lepton Flavour

16-17 June, 2022, Valencia

Title: [Neutrino properties from oscillations](#)

XXX International Conference on Neutrino Physics and Astrophysics (Neutrino 2022)

30 May - 4 June 2022, Online

Contribution: Poster • [A solar electron antineutrino flux from magnetic moments](#)

Online explanatory video • [A solar electron antineutrino flux from magnetic moments](#)

19th MultiDark Consolider Workshop

23 - 25 May, 2022, Miraflores de la Sierra (Spain)

Contribution: Plenary talk • [Non-standard interactions from the future solar sector](#)

@FlipPhysic

21-25 March, 2022, Valencia (Spain)

Contribution: Parallel talk • [Signatures of primordial black hole dark matter in DUNE and THEIA](#)

Invited talk for the **Journal Club of INFN, Sezione di Torino**

25 February, 2022, Online

Title: [Non-standard interactions from the future neutrino solar sector](#)

Gravitículas Seminar, Facultad de Física, Pontificia Universidad Católica de Chile

25th November, online

Title: [Terrestrial and cosmological probes of non-standard neutrino interactions](#)

Second Annual conference “COST - Quantum Gravity Phenomenology in the Multimessenger Approach”

8 - 10 March 2021, Corfu, Greece (Online participation)

Contribution: Plenary (online) talk - [Cosmological radiation density and neutrino non-standard interactions](#)

17th International Conference on Topics in Astroparticle and Underground Physics (TAUP 2021)

26 August - 6 September, 2021, Online

Contribution: Parallel Talk (video) • [Cosmological radiation density with non-standard interactions](#)

The 28th International workshop on Weak Interactions and Neutrinos (WIN2021)

7 - 12 June, 2021, online

Contribution: Award-winning poster • [Non-standard interactions and the future of the neutrino solar sector](#)

First EuCAPT Annual Symposium

5 - 7 May, 2021, online

Contribution: Flash talk • [Signatures of ultralight scalars in neutrino oscillation experiments](#)

17th MultiDark Consolider Workshop

25 - 27 January, 2021, online

Contribution: Plenary talk • [Signatures of ultralight dark matter in neutrino experiments](#)

XXIX International Conference on Neutrino Physics and Astrophysics (Neutrino 2020)

22 June - 2 July 2020, online

Contribution: Poster • [DUNE as an ultralight dark matter detector](#)

Online explanatory video • [DUNE as an ultralight dark matter detector](#)

First Annual conference “COST - Quantum Gravity Phenomenology in the Multimessenger Approach”

10 - 13 March 2020, Granada, Spain

Contribution: Plenary talk - [Sterile neutrinos and altered dispersion relations](#)

16th MultiDark Consolider Workshop

25 - 27 September, 2019, La Rábida, Huelva (Spain)

Contribution: Plenary talk • [On sterile neutrino and altered dispersion relations](#)

OUTREACH AND DIVERSITY ACTIVITIES

High-school talks in the context of the International day of Women and Girls in Science (Female pioneers in the Universe - Pioneras en el Universo).

High-school outreach talks on Astroparticle Physics (Beyond light: Particle experiments in unexpected locations - Más allá de la luz: Experimentos de partículas en lugares insólitos).

Member of the Outreach and Diversity Committee of COST ACTION CA18108, “Quantum Gravity phenomenology in the multi-messenger approach”. Highlighted activities:

Actively involvement in the campaigns for the International day of Women and Girls in Science.

Shared administration and content creation of the Instagram Account.

Masterclass Hands on Particle Physics: MINERvA (31 March 2022, Valencia)

Mentoring and supervision of high-school students during the exercise.

XIV EXPOCIENCIA (28 May 2022, Valencia)

Open Days of the Parc Científic. Participation in the activity “Cocinando en el Ártico” (Cooking in the Artic).

TEACHING AND MENTORING

Academic year 2022 - 2023

Mechanics II (Theoretical classical mechanics)

Bachelor studies in Physics (University of Valencia)

Assistant to the teaching professor (problem solving lectures and grading)

Co-mentoring of an end-of-bachelor thesis

Title: Oscil·lacions de sabor dels neutrins solars (Flavour oscillations and solar neutrinos)

Student: Lluís Mira Castelló

Title: Oscil·lació de neutrins en el marc de la mecànica quàntica (Neutrino oscillations in quantum mechanics)

Student: Víctor Viciach Gallego

Academic year 2021 - 2022

Mechanics II (Theoretical classical mechanics)

Bachelor studies in Physics (University of Valencia)

Assistant to the teaching professor (problem solving lectures and grading)

Co-mentoring of an end-of-bachelor thesis

Title: Neutrins i l'evolució de l'univers (Neutrinos and the evolution of the Universe)

Student: Gracia Garcia

Academic year 2020 - 2021

Physics I

Bachelor studies in Chemistry (University of Valencia)

Assistant to the teaching professor (problem solving lectures and grading)

General Physics I

Bachelor studies in Mathematics and Physics (University of Valencia)

Assistant to the teaching professor (problem solving lectures and grading)

INVOLVEMENT IN EVENT ORGANISATION AND PEER REVIEWING

Peer reviewer for the Journal of High Energy Physics, Physics Letters B, Physical Review Letters, and Physical Review D.

Co-organiser of the Astroparticle Journal Club at the Niels Bohr Institute

Copenhagen, January 2023 - present

Local Organising Committee of the First EuCAPT School: Cosmology

Valencia, 18-22 September 2023.

PhD Student Seminar on Hints on BSM physics

November 2021, Heidelberg, Germany

Member of the organisation of the PhD Student Seminars on Theoretical Particle and Astro-Particle Physics from the MPIK Division on Particle and Astroparticle Physics and presenter of a topical seminar.

Scientific secretary for TAUP 2021 and ISAPP 2021 Valencia

Active participation in the preparation of the virtual poster sessions held with the online platform GatherTown and the summary webpages with the poster display.

Copenhagen, January 2023 - present

LANGUAGES & IT SKILLS

Spanish: Mother tongue

Catalan: Fluent (C1 certified - Junta Qualificadora de Coneixements de València)

English: Fluent (C1 certified - Cambridge)

French: Fluent (C1 certified - Escuela Oficial de Idiomas Valencia)

Coding languages: C/C++, Python, basic Mathematica, basic HTML5.

Specify software and packages: GLOBES, CLASS, MontePython, BlackHawk.

Miscellaneous: Microsoft Office, LaTeX, Adobe Illustrator, Adobe InDesign.

SCHOOLS AND DOCTORAL COURSES

ISAPP 2021 Valencia - Neutrino Physics, Astrophysics and Cosmology

21 - 30 July, Online

Contribution: Poster • [Cosmological radiation with non-standard neutrino-electron interactions](#)

Invisibles'19 School. Neutrinos, Dark matter & Dark energy

3 - 7 June 2019, Laboratorio Subterráneo de Canfranc (LSC), Spain

Contribution: Poster • [Sterile neutrinos and modified dispersion relations \(There's something about MiniBooNE\)](#)

Selected doctoral courses at University of Valencia

Machine Learning (24 hours) - Lecturer: Verónica Sanz

Statistics (10 hours) - Lecturer: Bryan Zaldivar

L@s Físic@s ante la sociedad y los medios de comunicación (Outreach, 10 hours) - Various lecturers