

José Manuel Carmona

FULL PROFESSOR · HEAD OF THE THEORETICAL PHYSICS DEPARTMENT

Departamento de Física Teórica y Centro de Física de Altas Energías (CAPA)
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Personal data

Date of birth: 03-05-1971 · Place of birth: Zaragoza (Spain)
Researcher ID: H-3732-2015 · Scopus ID: 57205308876 · ORCID: 0000-0003-2264-2306
Specialization (UNESCO codes): 220807, 229001
h-index: 34 (source: Google Scholar)
Present Position: Full Professor (Catedrático de Universidad) · Start date: 2019

Education

Universidad de Zaragoza GRADUATE IN PHYSICS	Zaragoza (Spain) June 1994
Universidad de Zaragoza MASTER THESIS IN PHYSICS	Zaragoza (Spain) 27-04-95
Universidad de Zaragoza PHD IN PHYSICS	Zaragoza (Spain) 12-11-98

European Doctorate mention of the PhD thesis

Languages

ENGLISH, FRENCH AND ITALIAN (ADVANCED LEVEL)

Professional Experience

2009-2019 **Profesor Titular de Universidad**, Universidad de Zaragoza
2006-2009 **Profesor Contratado Doctor**, Universidad de Zaragoza
2001-2006 **Profesor Ayudante**, Universidad de Zaragoza
1999-2001 **Postdoctoral researcher**, Università di Pisa
1995-1998 **PhD fellow**, Universidad de Zaragoza
1993-1994 **Collaboration fellowship**, Universidad de Zaragoza

Advised PhD theses

Disorder and phase transitions in spin models SERGIO JIMÉNEZ SANJUÁN • <i>Advisors</i> : Alfonso Tarancón and José Manuel Carmona • <i>Mark</i> : Sobresaliente “cum Laude”	Universidad de Zaragoza 14/01/2005
Desviaciones respecto a relatividad especial no contenidas en el marco convencional de teoría cuántica de campos local DIEGO MAZÓN JAREÑO • <i>Advisors</i> : José Luis Cortés and José Manuel Carmona • <i>Mark</i> : Sobresaliente “cum Laude”	Universidad de Zaragoza 20/03/2013
Beyond special relativity and the notion of spacetime JOSÉ JAVIER RELANCIO MARTÍNEZ • <i>Advisors</i> : José Luis Cortés and José Manuel Carmona • <i>Mark</i> : Sobresaliente “cum Laude”	Universidad de Zaragoza 28/04/2020

Mentoring

2020-2021	Ángel Vincueria Cuartas, Modificaciones en el espectro de fotones cósmicos...	U/g thesis
2019-2020	Leire Salamero Lorea, Efectos no convencionales en la física de neutrinos...	U/g thesis
2018-2019	Lucía Pereira Sáinz, Astrofísica de rayos gamma de muy alta energía como ventana...	Master thesis
2018-2019	Juan Mairal Ascaso, Tiempos de vuelo de fotones más allá del marco de la relatividad...	U/g thesis
2018-2019	Maykoll A. Reyes Hung, Observaciones de neutrinos de muy alta energía...	Master thesis
2017-2018	Lucía Pereira Sáinz, Tests de simetría Lorentz utilizando observaciones astrofísicas...	U/g thesis
2017-2018	Maykoll A. Reyes Hung, Indicaciones de nueva física en el espectro de neutrinos...	Master thesis
2016-2017	Germán Albalate Sevilla, Consecuencias fenomenológicas de una generalización...	U/g thesis
2015-2016	Luis Eduardo Suelves, Posibles efectos de la escala de Planck en la propagación...	U/g thesis
2014-2015	José Javier Relancio Martínez, Más allá de la noción de espacio-tiempo...	Master thesis
2012-2013	Beatriz Romeo Zaragoza, Violación de la invariancia Lorentz: teoría/fenomenología	Master thesis
2012-2013	Rodrigo Gracia Ruiz, No aditividad de la energía en las enanas blancas	P/g research

Teaching Experience

2001-2021	Physics, Degree in Chemistry, University of Zaragoza	U/g lectures
2003-2014	High energy physics, Degree in Physics, University of Zaragoza	U/g lectures
2012-2021	History of Science, Degree in Physics, University of Zaragoza	U/g lectures
2006-2014	Philosophical aspects of physics, Master in Physics and Physical Technologies, Unizar	Master
2014-2020	Research methodology in physics, Master in Physics and Physical Technologies, Unizar	Master
2015-2019	Science stories, Universidad de la Experiencia	Elderly

Selected publications

- 2020.** J.M. Carmona, J.L. Cortés, J.J. Relancio, *Relativistic deformed kinematics from locality conditions in a generalized spacetime*, Physical Review D 101, 044057: 1-15.
- 2019.** J.M. Carmona, J.L. Cortés, J.J. Relancio, *Relativistic deformed kinematics from momentum space geometry*, Physical Review D 100, 104031: 1-10.
- 2018.** J.M. Carmona, J.L. Cortés, J.J. Relancio, *Spacetime from locality of interactions in deformations of special relativity: The example of κ -Poincaré Hopf algebra*, Physical Review D 97, 064025: 1-12.
- 2018.** J.M. Carmona, J.L. Cortés, J.J. Relancio, *Does a deformation of special relativity imply energy dependent photon time delays?*, Classical and Quantum Gravity 35, 025014: 1-14.
- 2017.** V. Anastassopoulos et al. (CAST Collaboration), *New CAST limit on the axion-photon interaction*, Nature Physics 4109: 1-8.
- 2016.** J.M. Carmona, J.L. Cortés, J.J. Relancio, *Beyond special relativity at second order*, Physical Review D 94, 084008: 1-18.
- 2015.** J.M. Carmona, J.L. Cortés, B. Romeo, *Nonuniversal relativistic kinematics*, Physical Review D 91, 085036: 1-12.
- 2012.** J.M. Carmona, J.L. Cortés, F. Mercati, *Relativistic kinematics beyond special relativity*, Physical Review D 86, 084032: 1-10.
- 2012.** J.M. Carmona, J.L. Cortés, D. Mazón, *Uncertainties in constraints from pair production on superluminal neutrinos*, Physical Review D 85, 113001: 1-15.
- 2010.** F. Mercati, D. Mazón, G. Amelino-Camelia, J.M. Carmona, J.L. Cortés, J. Induráin, C. Lämmerzahl, G.M. Tino, *Probing the quantum-gravity realm with slow atoms*, Classical and Quantum Gravity 27, 215003: 1-18.
- 2009.** E. Arik et al. (CAST Collaboration), *Probing eV-scale axions with CAST*, Journal of Cosmology and Astroparticle Physics 02, 008: 1-15.
- 2007.** S Andriamonje et al. (CAST Collaboration), *An improved limit on the axion-photon coupling from the CAST experiment*, Journal of Cosmology and Astroparticle Physics 04, 010: 1-23.
- 2006.** J.M. Carmona, J.L. Cortés, A. Das, J. Gamboa, F. Méndez, *Matter-antimatter asymmetry generated at low temperatures*, Mod. Phys. Lett. A 21: 883-892.
- 2005.** K. Zioutas et al. (CAST Collaboration), *First results from the CERN Axion Solar Telescope*, Physical Review Letters 94, 121301: 1-5.

- 2003.** J.M. Carmona, S. Cebrián, E. García, I.G. Irastorza, G. Luzón, A. Morales, J. Morales, A. Ortiz de Solórzano, J. Puimedón, M.L. Sarsa, J.A. Villar, *Neutron background at the Canfranc Underground Laboratory and its contribution to the IGEX-DM dark matter experiment*, *Astroparticle Physics* 21: 523-533.
- 2003.** F. Gulminelli, J.M. Carmona, Ph. Chomaz, J. Richert, S. Jiménez, V. Regnard, *Transient backbending behavior in the Ising model with fixed magnetization*, *Physical Review E* 68, 026119: 1-9.
- 2003.** J.M. Carmona, J.L. Cortés, J. Gamboa, F. Méndez, *Quantum theory of noncommutative fields*, *Journal of High Energy Physics* 058: 1-12.
- 2003.** J.M. Carmona, J.L. Cortés, J. Gamboa, F. Méndez, *Noncommutativity in field space and Lorentz invariance violation*, *Physics Letters B* 565: 222-228.
- 2002.** J.M. Carmona, M. D'Elia, L. Del Debbio, A. Di Giacomo, B. Lucini, G. Paffuti, *Color confinement and dual superconductivity in full QCD*, *Physical Review D* 66, 011503:1-4.
- 2002.** J.M. Carmona, J. Richert, P. Wagner, *Order parameter fluctuations and thermodynamic phase transitions in finite spin systems and fragmenting nuclei*, *Physics Letters B* 531: 71-76.
- 2002.** J.M. Carmona, J.L. Cortés, *Infrared and ultraviolet cutoffs of quantum field theory Testing Lorentz invariance violations in the tritium beta-decay anomaly*, *Physics Review D* 65, 025006: 1-5.
- 2001.** J.M. Carmona, M. D'Elia, A. Di Giacomo, B. Lucini, G. Paffuti, *Color confinement and dual superconductivity of the vacuum. III*, *Physical Review D* 64, 114507: 1-7.
- 2000.** J.M. Carmona, J.L. Cortés, *Testing Lorentz invariance violations in the tritium beta-decay anomaly*, *Physics Letters B* 494: 75-80.
- 2000.** J.M. Carmona, A. Pelissetto, E. Vicari, *N-component Ginzburg-Landau Hamiltonian with cubic anisotropy: A six-loop study*, *Physical Review B* 61: 15136-15151.
- 1998.** J.M. Carmona, J. Richert, A. Tarancón, *A model for nuclear matter fragmentation: phase diagram and cluster distributions*, *Nuclear Physics A* 643: 115-134.
- 1998.** J.M. Carmona, U. Marini Bettolo Marconi, J.J. Ruiz-Lorenzo, A. Tarancón, *Critical properties of the Ising model on Sierpinski fractals: A finite-size scaling-analysis approach*, *Physical Review B* 58: 14387-14396.
- 1996.** J.L. Alonso, J.M. Carmona, J. Clemente Gallardo, L.A. Fernández, D. Iñiguez, A. Tarancón, C.L. Ullod, *Phase diagram of $d=4$ Ising model with two couplings*, *Physics Letters B* 376: 148-153.

International Research Experience

Laboratoire de Physique Théorique, Université Louis Pasteur

Strasbourg (France)

14 WEEKS

1997, 1998, 2002, 2004

- Topic: Nuclear fragmentation and renormalization group in antiferromagnetic systems

Dipartimento di Fisica, Università di Pisa

Pisa (Italy)

26 MONTHS

1998 – 2001

- Topic: Confinement in QCD

CERN

Geneve (Switzerland)

15 WEEKS

Stays between 2003 and 2015

- Topic: CAST Experiment

Participation in committees and international representations

Since 2019	Action Chair and Management Committee member of COST Action CA18108, Phenomenology of quantum gravity and multimessenger astroparticle physics	COST, EU Horizon 2020
2005-2009	ILIAS (Integrated Infrastructures in Astroparticle Science) Executive Board, Astroparticle and underground physics	ApPEC, EU FP6

Outreach & Professional Development

SERVICE

- Since 2020 **Head of Department**, Department of Theoretical Physics, University of Zaragoza
- Since 2019 **Secretary of the Center of Astroparticle and High-Energy Physics (CAPA)**, University of Zaragoza
- 2008-2020 **Secretary Professor**, Department of Theoretical Physics, University of Zaragoza

EDITORIAL AND EVALUATION WORK

Experience as a referee of a total of 88 different manuscripts in the following journals: *Physical Review Letters, Physical Review B, E and D, European Journal of Physics, Astroparticle Physics, Europhysics Letters, International Journal of Modern Physics A and D, Annalen der Physik, Entropy, Universe, Symmetry, Journal of Cosmology and Astroparticle Physics, General Relativity and Gravitation, Physical Review Research, Modern Physics Letters A.*

External evaluator of research infrastructures for the Ministry of Education, Youth and Sports of the Czech Republic (2014 and 2017), the Italian programs PRIN2017 and Giovanni Ricercatori – Rita Levi Montalcini (2018), the Italian INFN Theory Committee (2020) and the Croatian Research Foundation (2020).

Guest editor of the special issue “Astrophysical Tests of Modifications to the Symmetry of Special Relativity” in the journal *Symmetry*.

ORGANIZATION OF MEETINGS

- Coorganizer of the COST CA18108 First Annual Conference**, 10-13 March 2020, University of Granada (<https://indico.capa.unizar.es/event/2/>).
- Member of the organizing committee** of the *International Summer Workshop on High Energy Physics*, in Benasque (Spain), with 38 doctoral students (September 2018).
- Member of the local organizing committee** of the international conference *11th Patras Workshop on Axions, WIMPs and WISPs*, in Zaragoza (Spain), with 122 participants (June 2015).
- Member of the organizing committee** of the meetings *Fourth Joint JRA1/N2 Meeting* and *Seventh Joint JRA1/N2 Meeting*, held in Zaragoza in the framework of the ILIAS project, in July 2006 and November 2007, respectively.
- Scientific secretary** in the international conference *Lattice 99 (XVII International Symposium on Lattice Field Theory)*, with 374 participants (June 1999).

PARTICIPATION IN OUTREACH EVENTS

- Collaboration in the organization of activities** to celebrate the *Dark Matter Day* in the University of Zaragoza (October 2017 and October 2018), including the delivering of talks at secondary schools.
- Participation** in the *European Researcher’s Night* with the activity *Astroparticle Hunters* (September 2018 and 2019).
- Presentation of the activity** *Dark Matter Gymkhana* in the *Innovative Outreach Days*, held in Zaragoza in October 2018.
- Outreach talks** in the 2015 and 2016 editions of the *Pint of Science* festival.

AWARDS

- 2016 **Award to winning essay**, VII CPAN (Spanish National Center of Particle, Astroparticle and Nuclear Physics) dissemination contest
- 1999 **Bruno Rossi Scholarship**, awarded at the end of the Int. School of Subnuclear Physics, Erice (1999), by its directors G. ’t Hooft, G. Veneziano and A. Zichichi
- 1995 **Third National Prize for completion of studies in physics**, corresponding to the academic year 1993-1994