

Part A. PERSONAL DATA		Date	01/02/15
Name	Carlos Peña Garay		
ID	76936360A	Age	46
Núm. identificación del investigador	Researcher ID		
	Código Orcid		

A.1. PRESENT JOB

INSTITUTION	CSIC		
Department	IFIC – Instituto de Física Corpuscular		
Address	Edificio Institutos de Investigación P.O. 22085 E-46071 Valencia - Spain		
Phone	963543546	e-mail	penya@ific.uv.es
Prof. Status	Científico Titular	Start	June 2006
UNESCO area code	2212		
Keywords	Astroparticle Physics and Cosmology		

A.2. Education

Bachelor/Ph.D.	University	Yr
Ph.D. in Theoretical Physics	Univ. Valencia	2002
Grade in Chemistry and Physics	Univ. Valencia	1992/1998

A.3. Quality indexes

Recognized 6-yr research terms: 2
 Next term: 2018
 Number of Ph.D. thesis supervised: 4 (2 + 2)

Source: INSPIRE, the High Energy Physics information system
 Number of citeable papers: 79 Citations: 4700 h-index: 37
 Publications with more than 100 citations: 17

Part B. CV Summary

Carlos Peña Garay leads the theoretical research in solar neutrinos. Carlos participated in the resolution of the solar neutrino problem, difference between observed and standard solar model neutrino fluxes, what led to the discovery of neutrino masses and flavor mixing. In 1999, Carlos was the first to show that the correct solution to the solar neutrino problem was the one with large mixing named as the LMA solution. Since 2003, Carlos published influential works on solar neutrinos, a roadmad for future solar neutrino experiments and the relevance of the discovery of CNO cycle neutrinos. Nowadays, Carlos leads the most precise calculations of solar neutrino fluxes and works with the Borexino collaboration, which is leading the discovery of neutrinos produced by several nuclear reactions in the Sun.

Carlos Peña Garay has produced the most precise calculations in cosmological simulations of dark matter and neutrinos. These calculations permitted Carlos to characterize in detail the shape of the neutrinos phase space distribution, with a density profile wit a core and a distorted Fermi Dirac distribution at low momenta. Most importantly, these simulations serve to predict cosmological observables sensitive to the neutrino mass. Lensing profiles of many galaxy clusters are among the best observables to verify the existence of the cosmological neutrino background and determine the neutrino masses.

Carlos Peña Garay has contributed in many areas in Astroparticle Physics and Cosmology, including neutrino oscillations, high energy neutrinos, neutrinoless double beta decay, dark matter and modified gravity. In particular, Carlos is making pioneering proposals in searches of QCD axions and on the origin of low energy positrons observed in our galaxy by INTEGRAL and previous X-ray telescopes. Other contributions in science include a physical model of the human gut microbiota to describe the routes to disease.

Part C. MERITS

C.1. Publications (10 most relevant)

F. Villaescusa-Navarro, S. Bird, C. Pena-Garay, M. Viel (2013). `` Non-linear evolution of the cosmic neutrino background " JCAP **1303**, 019.

A. M. Serenelli, W. C. Haxton, C. Pena-Garay (2011), `` Solar models with accretion. I. Application to the solar abundance problem " Astrophys. J. **743**, 24 (2011).

G. Bellini *et al.* [Borexino Collaboration] (posición por orden alfabético 58/89) (2011). `` Precision measurement of the 7Be solar neutrino interaction rate in Borexino " Phys. Rev. Lett. **107**, 141302.

R. Jimenez, T. Kitching, C. Pena-Garay, L. Verde (2010). `` Can we measure the neutrino mass hierarchy in the sky?" JCAP **1005**, 035.

A. Achterberg *et al.* [IceCube Collaboration] (posición por orden alfabético 138/214) (2006) ``First Year Performance of The IceCube Neutrino Telescope" Astropart. Phys. **26**, 155.

J.N. Bahcall, H. Murayama, C. Pena-Garay (2004). `` What can we learn from neutrinoless double beta decay experiments?" Phys. Rev. **D70**, 033012.

J.N. Bahcall, C. Pena-Garay (2003). `` Global analyses as a road map to solar neutrino fluxes and oscillation parameters" JHEP **0311**, 004.

J.N. Bahcall, M. C. Gonzalez-Garcia, C. Pena-Garay (2003). `` Does the sun shine by pp or CNO fusion reactions?" Phys. Rev. Lett. **90**, 131301.

J.N. Bahcall, M. C. Gonzalez-Garcia, C. Pena-Garay (2001). ``Global analysis of solar neutrino oscillations including SNO CC measurement" JHEP **0108**, 014.

M. C. Gonzalez-Garcia, P. C. De Holanda, C. Pena-Garay, J. W. F. Valle (2000). `` Status of the MSW solutions of the solar neutrino problem " Nucl. Phys. B **573**, 3.

C.2. Projects

CSD2007-00060 PAU: Physics of the Accelerating Universe. MICINN Consolider. E. Fernández(Coord.) C. Peña Garay (IFIC IP) 5Meuros 3/12/2007-31/12/2014

MREFC 2003 ICECUBE: South Pole Neutrino Observatory. NSF Science Division 2003-2006. F. Halzen(Coord.) C. Peña Garay (Princeton IP) 50M\$ 21/3/2003-1/6/2006

C.5. Other

- Ph.D. with Honors (2002). Theoretical Physics. Univ. of Valencia.
- Long-Term Member Fellow (2003-2006). Institute for Advanced Study. Princeton.
- Best Spanish Research in Th. Physics by the Spanish Royal Physics Society (2003).