

CURRICULUM VITAE

PERSONAL:

Family, First name: Pérez de los Heros, Carlos

Nationality: Spanish

Professional address: Department of Physics and Astronomy
Uppsala University. Box 516
S-75120 Uppsala. Sweden

email: cph@physics.uu.se **office phone:** +46 18 4713256

ORCID ID: 0000-0002-2084-5866

Languages: Spanish (native), Swedish (fluent), English (fluent), French (basic)

DOCTORAL DEGREE:

PhD in Physics, Weizmann Institute of Science, Rehovot, Israel. April 1996.

Thesis Title: *Low mass e^+e^- production in S-Au collisions at 200 GeV/n*. Supervisor: Prof. Itzhak Tserruya, Weizmann Institute of Science. 105 pages monograph on the analysis and interpretation of data from the CERN experiment NA45 on collisions of relativistic nuclei (^{32}S and ^{197}Au) in search for the formation of quark-gluon plasma, a predicted new form of matter. The paper 'Enhanced production of low mass electron pairs in 200-GeV/u S - Au collisions at the CERN SPS', G. Agakishiev et al. Phys. Rev. Lett. 75,1272, (1995) describes the results.

APPOINTMENT AS DOCENT:

Docent in Physics with Specialization in Elementary Particle Physics, Uppsala University. October 2002.

PRESENT POSITION:

Associate professor Department of Physics and Astronomy. Uppsala University.
(Lektor)

PREVIOUS POSITIONS:

Jan. 2000 - Dec. 2005: Swedish Research Council Senior Researcher (VR särskild forskare) in the AMANDA/ICECUBE experiments at the Department of Physics and Astronomy, Uppsala University. Six year tenure-track position fully funded by the Swedish Research Council. Research-only position.

Feb. 1999 - Dec. 1999: Research associate at the Department of Physics and Astronomy, Uppsala University. Funded by a Rector's Office grant from Uppsala University. Research-only position.

Feb. 1997 - Feb. 1999: Marie Curie Postdoctoral fellowship at the Department of Physics and Astronomy, Uppsala University, under the EU 4th Framework of Training and Mobility of Researches. Research-only position.

Aug. 1991 - Apr. 1996: Doctoral fellowship at the Department of Particle Physics of the Weizmann Institute, Israel. Funded through a grant of the Feinberg Graduate School of the Weizmann Institute.

Oct. 1990 - Jul. 1991: Contract as Resident Astrophysicist at the IAC (Astrophysics Institute of the Canary Islands). Research-only position.

Mar. 1988 - Sep. 1990: Postgraduate fellowship at CIEMAT (Center for Technology, Environment and Energy Research), Madrid. Funded by a CIEMAT grant. Research-only position.

TEACHING AND SUPERVISION EXPERIENCE:

Long experience in teaching at both the undergraduate and graduate level, both in English and Swedish. Among the courses I have taught there are Classical Mechanics I and II, Astoparticle Physics, Astrophysical Tests of Physical Theories, Quantum Physics, Wave Mechanics and Optics and Nuclear Physics. Additionally, I have been invited as lecturer in the 2011, 2013 and 2014 summer International

School on Astroparticle Physics (ISAPP), held in Heidelberg, Stockholm and Belgirate (Italy) respectively. Invited to give a PhD course on Astroparticle Physics at the University of Granada (Spring 2019) and invited lecturer at “Taller de Altas Energías” doctoral school held in Benasque, Spain, 2014.

PhD thesis supervision

- “Bright Needles in a Haystack: A Search for Magnetic Monopoles Using the IceCube Neutrino Observatory”, by Alexander Burgman. Uppsala University 2020. ISBN 978-91-513-1083-1. Main supervisor.
- “Dark Matter in the Galactic Halo: A Search Using Neutrino Induced Cascades in the DeepCore Extension of IceCube” by Henric Taavola, Uppsala University 2015, ISBN: 978-91-554-9377-6. Co-supervisor.
- “Search for low mass WIMPs with the AMANDA neutrino telescope” by Anna Davour, Uppsala University 2007. ISBN:978-91-554-6909-2. Co-supervisor.
- Co-supervisor of a thesis on detection of high energy neutrinos from Supernovae (ongoing)

MSc thesis supervision

- “Study of the effect of the dark matter velocity distribution on its capture on heavy celestial objects” by Martin Stål, Uppsala University 2019.
- “Characterization of monopole showers in the atmosphere” by Jan Rol, Uppsala University 2017.
- “PINGU sensitivity to dark matter candidates” by Christoph Raab, Uppsala University 2013.
- “Dark matter searches with IceCube: Constrains on the NMSSM and CPVMSSM” by Pierre Laurent, Uppsala University 2012.

Project supervision

- “A search for a prompt atmospheric muon neutrino flux in the northern hemisphere using data releases from IceCube”, by Marcus Haberland, Uppsala University, 2020.
- “Searches for Kaluza-Klein dark matter with IceCube data”, by Miquel Colomb, Uppsala University, 2019.
- “Producing a database of MSSM scans using DarkSusy”, by Sasha Stahl, Uppsala University, 2008.
- “Characterization of high energy particle cascades induced by electron neutrino interactions” by Veronica Sorin, Stockholm University 1999.

EXPERT DUTY:

- Member of the examination committee of 24 PhD thesis, 9 of them abroad.
- Referee of the JCAP journal.
- Expert external referee of the Spanish National Scientific Evaluation Agency.
- Expert external referee of the Estonian Research Council.

MEMBERSHIP IN SCIENTIFIC SOCIETIES:

- Swedish Physical Society
- European Physical Society
- International Astronomical Union.

During 2008-2011, member of the steering committee of the Particle and Astroparticle Physics section of the Swedish Physical Society. During 2010-2011, Chairman of the mentioned section.

MANAGEMENT RESPONSIBILITIES, COMMITTEE AND SERVICE WORK:

Within the Department of Physics and Astronomy of Uppsala University

- 2017-2019: Member of the Equal Opportunity Group of the Department of Physics and Astronomy.
- 2004-2010: Coordinator of the ERASMUS/SOCRATES and NORDPLUS exchange programs of the Department of Physics and Astronomy (NORDPLUS is an exchange program between the Nordic and Baltic countries).
- 2002-2004: Responsible for the organization of the weekly seminars of the departments of Nuclear Physics and High Energy Physics

Within the AMANDA and IceCube collaborations

- 2018-present: Member of the IceCube Collaboration Board as one of the two representatives from the Uppsala University group.
- 2008-present: Member of the Trigger and Data Filter board of the IceCube collaboration.
- 2014-2018: Member of the Publications Committee of the IceCube collaboration.
- 2008-2016: Leader of the “Dark matter” working group (2008-2013) and co-leader of the “Beyond the Standard Model Working Group” (2014-2016) of the IceCube collaboration.
- 2000-2004: Software coordinator of the AMANDA experiment (re-elected in 2002 for a second 2-year term).

Other

- 2019-2023: Swedish representative in the EU COST Action CA18108 “Quantum gravity phenomenology in the multi-messenger approach”, qg-mm.unizar.es. COST is a European funding organization for research networks.
- 2009-2013: Swedish representative to ECFA (European Committee for Future Accelerators).
- 2010-2011: Chair of the steering committee of the Particle and Astroparticle Physics section of the Swedish Physical Society.

PUBLICATIONS IN INTERNATIONAL PEER-REVIEW JOURNALS:

Author or co-author of 215 publications in refereed journals (not including conference proceedings). Six publications with more than 500 citations, 74 publications with more than 100 citations.

Review articles:

- Invited author of the review article “*Status, Challenges and Directions in Indirect Dark Matter Searches*”, C. Pérez de los Heros, *Symmetry* **12** (2020) no.10, 1648.
- One of the three invited authors of the review article “*Probing Particle Physics with IceCube*”, M. Ahlers, K. Helbing, C. Pérez de los Heros, *Eur. Phys. J. C*, 78 11 (2018) 924.

Books and book chapters:

- Editor of the book “*Probing Particle Physics with Neutrino Telescopes*”. World Scientific, 2020. 424 p. ISBN: 978-981-327-501-0.
- Invited author of the review chapter “The Quest for Dark Matter with Neutrino Telescopes” for the book “*Neutrino Astronomy Current Status, Future Prospects*”, T. Gaisser, A. Karle, editors. World Scientific, 2017. 225 p. ISBN: 978-981-4759-40-3.
- Editor of the proceedings of the first *Workshop on Exotic Physics with Neutrino Telescopes*, Uppsala University publications, 2007. ISBN 978-91-506-1913-3. Also in astro-ph/0701333.
- Co-editor of the proceedings of the *XXII International Symposium on Lepton and Photon Interactions at High Energy 2005*, World Scientific, ISBN: 978-981-256-662-1.

PARTICIPATION AND ORGANIZATION OF CONFERENCES AND SEMINARS:

Author or co-author of 95 conference proceedings. Oral contributions to 29 international conferences. Other activities related to conference organization:

- Member of the International Organizing Committee of the workshop “Very Large Volume Neutrino Telescopes (VLVnT2021)” To be held online on May 18-21, 2021.
- Convener of the “Dark Matter indirect detection” section of the “2020 Roma International Conference on Astroparticle Physics (RICAP20)”. Planned for June 30-July 3rd, 2020. Postponed to a new, yet undecided date.

- Chair of the organizing committee of the “4th Uppsala workshop on Particle Physics with Neutrino Telescopes”. Uppsala, October 7-9, 2019.
- Member of the local organizing committee of NUFAC 2017, Uppsala, September 25-30, 2017.
- Co-convener of the session “Indirect searches for dark matter” of the TeV Particle Astrophysics conference (TeVPA 2016). CERN, September 11-26, 2016.
- Co-convener of the session “Neutrino Physics” of the TeV Particle Astrophysics conference (TeVPA 2014). Amsterdam, June 23-28, 2014.
- Co-organizer of the First Global Neutrino network workshop on “Indirect dark matter searches with neutrino telescopes”. Valencia, April 10-11, 2014.
- Chair of the organizing committee of the “Second Workshop on Exotic Physics with Neutrino Telescopes”. Marseille, April 3-5, 2013.
- Chair of the organizing committee of the “Particle Days”, the annual meeting of the Swedish Physical Society. Uppsala, November 18-19, 2010, and November 31-December 1, 2015.
- Co-convener of the “Neutrino Physics” session of the PANIC08 conference. Eilat, November 9-14, 2008.
- Member of the organizing committee of the “Dark Universe day”. Uppsala, February 15, 2008.
- Organizer of the ERASMUS coordinators meeting in Uppsala, October 2008.
- Chair of the organizing committee of the “Workshop on Exotic Physics with Neutrino Telescopes”. Uppsala, September 20-22, 2006.
- Member of the organizing committee of the international symposium “Lepton-Photon 2005”. Uppsala June 30- July 7, 2005.

Oral presentations in conferences:

- “Heraeus-Seminar on Experimental Tests and Signatures of Modified and Quantum Gravity”, February 1-5, 2021. Online conference. (invited)
- “Quantum gravity phenomenology in the multi-messenger approach“. Granada, March 10-13, 2020. (invited)
- “European Physical Society Conference on High-Energy Physics (EPS-HEP2019)“. Ghent, July 10-17, 2019. (invited plenary)
- “XVIII International Workshop on Neutrino Telescopes (NEUTEL2019)“. Venice, March 18-22, 2019.
- “2nd GNN Workshop on Indirect Dark Matter Searches with Neutrino Telescopes (Dark Ghosts 2018)“. Brussels, November 13-14, 2018. (invited)
- “TeV Particle Astrophysics (TeVPA2018)“, Berlin, August 27-31, 2018. (Invited)
- “Gravitational-waves, ElectroMagnetic and dark MATter Physics Workshop (GEMMA2018)“. Lecce, June 4-7, 2018. (invited)
- “Perspectives in Astroparticle physics from High Energy Neutrinos“. Napoli, September 25-26, 2017. (invited)
- “1st GNN Workshop on Indirect Dark Matter Searches with Neutrino Telescopes (Dark Ghosts 2015)“. Valencia, April 10-11, 2015. (invited)
- “Solvay Workshop on *Neutrinos: from Reactors to the Cosmos*“. Brussels, May 27 - 29, 2015. (invited)
- “KUBEC Workshop on Dark Matter searches“. Brussels, August 27-29, 2014 (invited)
- “Workshop on Latest results from Dark Matter searches“, Nordita, Stockholm, May 12-14, 2014.
- “Astroparticle Physics in Antarctica“, NBI, Copenhagen, January 13, 2014. (invited)
- Meeting of the Center for Particle, Astroparticle and Nuclear Physics (CPAN). Santiago de Compostela, November 26-28, 2013. (invited)
- “Workshop on *Fundamental Physics, CMB and LSS in the light of Planck satellite and DES*“. Madrid, October 21-25, 2013. (invited)
- “TeV Particle Astrophysics (TeVPA2011)“. Stockholm, August 1-5, 2011.
- “Multidark Workshop“. Madrid, April 4-6, 2011. (invited)
- “International Conference on Dark Matter 2010“. Montpellier, July 26-30, 2010.
- “CosmoOLE workshop“. Valencia, October 12, 2009. (invited)
- “Roma International Conference on Astroparticle Physics (RICAPP2009)“. Rome, May 13-15, 2009.

- “Dark Energy Day“.Uppsala, February 5th, 2008.
- “1st AFI symposium *From the Vacuum to the Universe*”. Innsbruck, October 10-12, 2007. (invited)
- Symposium on “Neutrinos and Dark Matter in Nuclear Physics (NMD06)”. Paris, Sept. 3-9, 2006.
- “International Workshop on Particle Physics and the Early Universe (COSMO05)”. Bonn, August 28 - September 01, 2005. (invited)
- “International Europhysics Conference on High Energy Physics (HEP2005)“. Lisboa, July 21-27, 2005.
- “Tenth Nordic LHC Physics Workshop“. Stockholm, November 12-13, 2004. (invited)
- “Cosmic Ray International Seminar on GZK and Surroundings“. Catania, May 31 - June 4, 2004.
- “International Workshop on Particle Physics and the Early Universe“. Chicago, September 18-21, 2002.
- “Les Houches Euroconference on Neutrino Masses and Mixings“. Les Houches, June 18-22, 2001.
- “XIth Rencontres de Blois“. Blois, June 27-July 3, 1999.
- “Cosmology and Astroparticle Physics (CAPP98)“. CERN, Geneva, June 8-12, 1998.
- “16th European Cosmic Ray Symposium“. Alcalá de Henares, July 20-24, 1998.

Conference grants:

- Grant of 93400 SEK from the Swedish Research Council for the organization of the “4th Uppsala workshop on Particle Physics with Neutrino Telescopes”, May 2019.
- Grant of 46000 SEK from the Swedish Research Council for the organization of the “Workshop on Exotic Physics with Neutrino Telescopes”, January 2006.

Invited seminars:

University of Granada (2017), Chalmers Technical University (2017), Niels Bohr Institute (2014), Université de Geneve (2013), IFIC/Universidad de Valencia (2012), Universidad Autónoma de Madrid (2010), IFAE-Barcelona (2010), Weizmann Institute of Science (2006 and 2012), Université Libre de Bruxelles (2002 and 2008), Universidad Complutense de Madrid (1998), Universidad de Santiago de Compostela (1998 and 2006).

Scientific stays abroad:

- Invited as ‘Key Participant’ to the “Multi-Probe Identification of Dark Matter” program of the Kavli Institute, Santa Barbara, USA, April-June 2013.
- Invited researcher at the Université de Marseille, November-December 2011 (ranked first in the University list of proposed visitors) and November-December 2009.

GRANTS:

Grants as main applicant (to the Swedish Research Council):

- 570.000 SEK (approx 65.000 euro) per year for the period 2011-2014
- 621.000 SEK (approx 70.800 euro) per year for the period 2008-2010
- 624.000 SEK (approx 71.000 euro) per year for the period 2005-2007
- 629.000 SEK (approx 71.500 euro) per year for the period 2002-2004