

CV Date	26/01/2022
---------	------------

## Part A. PERSONAL INFORMATION

First Name	Diego		
Family Name	García Gámez		
Sex	Male	Date of Birth	27/06/1979
ID number Social Security, Passport	78968695N		
URL Web			
Email Address	ggamezdiego@gmail.com		
Open Researcher and Contributor ID (ORCID)	0000-0003-3452-3478		

### A.1. Current position

Job Title	Profesor Contratado Doctor		
Starting date	2021		
Institution	Universidad de Granada		
Department / Centre	Física Teórica y del Cosmos / Facultad de Ciencias		
Country		Phone Number	
Keywords	Physics - High energies - Experiment		

### A.2. Previous positions (Research Career breaks included)

Period	Job Title / Name of Employer / Country
2018 - 2021	Personal Docente e Investigador (Marie Skłodowska-Curie COFUND Actions, ATHENEA3i) / Universidad de Granada
2015 - 2018	Research Associate / The University of Manchester / United Kingdom
2011 - 2014	Postdoc / CNRS / University of Paris Sud / France
2010 - 2010	Research contract/ Contrato de investigación / University of Granada / Spain
2006 - 2010	PhD student/ 2 años beca + 2 años contrato / Consejería de Innovación, Ciencia y Empresa de la Junta de Andalucía / Spain
2006 - 2006	Research contract/ Contrato de investigación / University of Granada / Spain
2004 - 2005	Grant (associated with project)/ Beca de investigación / University of Granada / Spain
2003 - 2004	Grant (Proyecto de innovación docente) / University of Granada / Spain

### A.3. Education

Degree/Master/PhD	University / Country	Year
Programa Oficial de Doctorado en Física y Matemáticas	Universidad de Granada / Spain	2010

## Part B. CV SUMMARY

My Ph.D. thesis opened a brand-new line of composition studies inside the Pierre Auger Collaboration (PAO). The technique I developed has been the base of 5 new theses produced inside the collaboration in different Universities. My work has influenced not only the current data taking activity but also the future direction the PAO will follow in the next decade of operations. The studies made in my thesis were published by the collaboration with me as the first author. My work was also selected to be presented at the topmost international conferences of the field: the ICRC series in its editions of 2013, 2015 and 2017 and the UHECR series in its 2012, 2014 and 2016 editions. I also developed the unique procedure to do pure hadronic

physics at the PAO at energies far beyond the reach of current particle accelerators using the huge amount of data recorded by the surface detector (100% duty cycle).

One of my most relevant responsibilities was the coordination and development of detailed Monte Carlo simulations for the SBND detector (near detector of the international Short-Baseline Neutrino Program at Fermilab) to study the performance of different types of Photon Detection Systems (PDS) within the LArSoft framework (common software infrastructure for reconstruction/simulation of liquid argon based detectors). These simulations have provided crucial input to the SBND decision on the light collection system. I have extended these studies to the DUNE far detector, and now, my PDS proposition, already formally accepted for construction by SBND, is one of the favourite design candidates considered by DUNE. I have also coordinated the production in the UK of the new components (wavelength shifter evaporated reflector foils) of the light collection system to be installed in SBND. This positions me as one of the crucial people in the design of the DUNE detector.

I participated actively in setting up the liquid argon lab constructed at the University of Manchester. We studied the performance of different boards to read the signal coming from different arrays of Silicon Photomultipliers at room and at liquid argon temperature. I am the Task Leader of the SBND detector geometry simulation, and the Task Leader of the Light Detection Simulation/ Reconstruction and Calibration for the Short Baseline Neutrino (SBN) program at Fermilab.

I have been the Production Manager in the UK of the Anode Plane Assemblies (APAs) wiring procedure for the ProtoDUNE Single Phase detector at CERN. I was also the leader in the design and building of a new electric-based system to carry out the measurement of the wire tension in these APAs in Liquid Argon Time Projection Chambers. I am the first author of a published paper explaining this novel technique. I have been nominated as Task Leader of the Wire Tension Measurements working group for the APAs in DUNE. I was proposed as the deputy manager in the UK for the APA production for the DUNE far detector (this project has an accepted budget of more than 10M€). I had to renounce this responsibility when accepting my new position in Spain.

I joined the University of Granada (Spain) in November 2018. I have been the Principal Investigator of a 3-year project funded with 200K€ from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 754446 and UGR Research and Knowledge Transfer Found-Athenea3i.

I have been the Task Leader (2018-2020) of the quality assurance (QA & QC) tests of the wire tensions of the Anode Plane Assemblies of the DUNE detector. I have coordinated one SBND detector commissioning project for online-monitoring of the photon detectors. I have worked in the development of a new model for scintillation light propagation that has been implemented in LArsoft package. I am the first author of a paper describing this model and demonstrating its capabilities. This is the model adopted by both SBND and DUNE (1st module) for their simulations.

My current position is Profesor Contratado Doctor indefinido. I am the Task Leader of the Simulation & Reconstruction of the Light Detection System of the SBND experiment. I am also the responsible of the Particle Physics Laboratory of the experimental group of the Dpto. de Física Teórica y del Cosmos.

## **Part C. RELEVANT ACCOMPLISHMENTS**

### **C.1. Most important publications in national or international peer-reviewed journals, books and conferences**

AC: corresponding author. (n<sup>o</sup> x / n<sup>o</sup> y): position / total authors. If applicable, indicate the number of citations

- 1 **Scientific paper.** Garcia-Gamez, Diego; Green, Patrick; Szec, Andrzej M.2021. Predicting transport effects of scintillation light signals in large-scale liquid argon detectors EUROPEAN PHYSICAL JOURNAL C. 81. ISSN 1434-6044. <https://doi.org/10.1140/epjc/s10052-021-09119-3>
- 2 **Scientific paper.** Abratenko, P.; An, R.; Anthony, J.; et al; MicroBooNE Collaboration. 2021. Search for a Higgs Portal Scalar Decaying to Electron-Positron Pairs in the MicroBooNE Detector PHYSICAL REVIEW LETTERS. 127. ISSN 0031-9007. <https://doi.org/10.1103/PhysRevLett.127.151803>
- 3 **Scientific paper.** Foreman, W.; Acciarri, R.; Asaadi, J. A.; et al; LArLAT Collaboration. 2020. Calorimetry for low-energy electrons using charge and light in liquid argon PHYSICAL REVIEW D. 101. ISSN 2470-0010. WOS (4) <https://doi.org/10.1103/PhysRevD.101.012010>
- 4 **Scientific paper.** Abratenko, P.; Alrashed, M.; An, R.; et al; MicroBooNE Collaboration. 2020. First Measurement of Differential Charged Current Quasielasticlike  $\nu(\mu)$ -Argon Scattering Cross Sections with the MicroBooNE Detector PHYSICAL REVIEW LETTERS. 125. ISSN 0031-9007. WOS (6) <https://doi.org/10.1103/PhysRevLett.125.201803>
- 5 **Scientific paper.** Garcia-Gamez, Diego; Basque, Vincent; Brooks, Thomas G.; Evans, Justin J.; Perry, Michael; Soldner-Rembold, Stefan; Spaggiardi, Fabio; Szec, Andrzej M.2019. A novel electrical method to measure wire tensions for time projection chambers NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT. 915. ISSN 0168-9002. WOS (2) <https://doi.org/10.1016/j.nima.2018.09.031>
- 6 **Scientific paper.** Abratenko, P.; Adams, C.; Alrashed, M.; et al; MicroBooNE Collaboration. 2019. First Measurement of Inclusive Muon Neutrino Charged Current Differential Cross Sections on Argon at E- $\nu$  similar to 0.8 GeV with the MicroBooNE Detector PHYSICAL REVIEW LETTERS. 123. ISSN 0031-9007. WOS (16) <https://doi.org/10.1103/PhysRevLett.123.131801>
- 7 **Scientific paper.** Aab, A.; Abreu, P.; Aglietta, M.; et al; Pierre Auger Collaboration. 2014. Muons in air showers at the Pierre Auger Observatory: Measurement of atmospheric production depth PHYSICAL REVIEW D. 90. ISSN 1550-7998. WOS (58) <https://doi.org/10.1103/PhysRevD.90.012012>
- 8 **Scientific paper.** Abreu, P.; Aglietta, M.; Ahn, E. J.; et al; Pierre Auger Collaboration. 2012. Measurement of the Proton-Air Cross Section at root s=57 TeV with the Pierre Auger Observatory PHYSICAL REVIEW LETTERS. 109. ISSN 0031-9007. WOS (193) <https://doi.org/10.1103/PhysRevLett.109.062002>
- 9 **Scientific paper.** Abraham, J.; Abreu, P.; Aglietta, M.; et al; Ziolkowski, M.2008. Observation of the suppression of the flux of cosmic rays above  $4 \times 10^{19}$  eV PHYSICAL REVIEW LETTERS. 101. ISSN 0031-9007. WOS (479) <https://doi.org/10.1103/PhysRevLett.101.061101>
- 10 **Scientific paper.** Abraham, J.; Abreu, P.; Aglietta, M.; et al; Pierre Auger Collaboration. 2007. Correlation of the highest-energy cosmic rays with nearby extragalactic objects SCIENCE. 318. ISSN 0036-8075. WOS (616) <https://doi.org/10.1126/science.1151124>

## C.2. Conferences and meetings

- 1 A semi-analytic method to predict the light signals in liquid argon detectors. LIDINE 2019: Light Detection In Noble Elements. University of Manchester. 2019. United Kingdom. Participatory - oral communication. Conference.
- 2 The Short Baseline Neutrino Program at Fermilab. 39th International Conference on High Energy Physics (ICHEP). C11 commission of the International Union of Pure and Applied Physics (IUPAP). 2018. Participatory - oral communication. Conference.

- 3 The SBND High Efficiency Light Collection System. LIDINE 2017: Light Detection In Noble Elements. SLAC National Accelerator Laboratory. 2017. United States of America. Participatory - oral communication. Conference.
- 4 The Short Baseline Near Detector at Fermilab. EPS Conference on High Energy Physics. Istituto Nazionale di Fisica Nucleare (INFN) and the Department of Physics and Astronomy of the Padua University. 2017. Italy. Participatory - oral communication. Conference.
- 5 Status of LBNF and DUNE. TeV Particle Astrophysics 2016. CERN. 2016. Switzerland. Participatory - oral communication. Conference.
- 6 Light Detection System simulations for SBND. The XXVII International Conference on Neutrino Physics and Astrophysics. Imperial College London. 2016. United Kingdom. Participatory - poster. Conference.
- 7 Observations of the longitudinal development of extensive air showers with the surface detectors of the Pierre Auger Observatory. 33rd International Cosmic Ray Conference. International Union of Pure and Applied Physics (IUPAP). 2013. Brazil. Participatory - oral communication. Conference.
- 8 Studies of hadronic interactions at ultra-high energies with the Pierre Auger Observatory. 47th Rencontres de Moriond on QCD and High Energy Interactions. CNRS (Centre National de la Recherche Scientifique), CEA (Commissariat à l'Énergie Atomique), IN2P3 (Institut National de Physique Nucléaire et de Physique des Particules), NSF, FNRS, BSP. 2012. Italy. Participatory - oral communication. Conference.

### C.3. Research projects and contracts

- 1 **Project.** DUNE UK Production Project. UKRI-STFC, United Kingdom. Justin Evans. (The University of Manchester). 01/10/2019-30/09/2023. 1.660.786 €.
- 2 **Project.** Contribución de la UGR al programa científico del experimento de neutrinos DUNE Referencia: PID2019-104676GB-C32. Ministerio de Economía, Industria y Competitividad. Antonio Bueno Villar. (Universidad de Granada). 01/06/2020-31/05/2023. 310.970 €.
- 3 **Project.** Extensiones del Modelo Estándar a distintas escalas: Aspectos teóricos y experimentales de la búsqueda de materia oscura y de la física de sabor (P18-FR-4314). Ministerio de Economía, Industria y Competitividad. José Santiago Pérez. (Universidad de Granada). 01/01/2020-31/12/2022. 120.737 €.
- 4 **Project.** Particle Physics Experimental Consolidated Grant. UKRI-STFC, United Kingdom. Stefan Söldner-Rembold. (The University of Manchester). 01/10/2019-30/09/2022. 5.466.421 €.
- 5 **Project.** Improved Scintillation Light readout in Argon. European Union's Horizon 2020 research and innovation program- me under the Marie Skłodowska-Curie and UGR. Diego García Gámez. (Universidad de Granada). 01/11/2018-31/10/2021. 162.000 €.
- 6 **Project.** Estudio de la Propiedades de los Rayos Cósmico y de los Neutrinos en la UGR. MINISTERIO DE ECONOMIA, INDUSTRIA Y COMPETITIVIDAD. Antonio Bueno Villar. (Universidad de Granada). 01/12/2018-31/12/2020. 96.800 €.
- 7 **Project.** DUNE: Pre-Construction Phase. STFC, PPRP. (The University of Manchester/Daresbury Laboratory). 01/10/2017-30/09/2019. 564.893 €.
- 8 **Project.** protoDUNE at CERN. STFC, PPRP. Justin Evans. (The University of Manchester). 01/10/2015-30/09/2017. 77.212 €.
- 9 **Project.** Développement d'un modèle génératif pour l'exp Auger. ANR SIMINOLE. (CNRS/Laboratoire de l'Accélérateur linéaire (LAL) - University of Paris Sud). 01/01/2011-31/12/2014.