

## CURRICULUM VITAE (CVA)

### Part A. PERSONAL INFORMATION

CV date	01.04.2025
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First name	Carlos Manuel		
Family name	Mariñas Pardo		

#### A.1. Current position

Position	Staff Researcher (Científico Titular OPI)		
Institution	CSIC – Spanish National Research Council		
Department/Center	Experimental Division	IFIC – Institute for Particle Physics	
Country	Spain	Phone number	
Keywords	Detectors, Pixels, Colliders, Future experiments, Vertexing, Trackers, Silicon, DMAPS, CMOS		

#### A.2. Previous positions

2022-2024 (16 months)	Ramón y Cajal Researcher, IFIC-CSIC, Spain
2019-2022 (38 months)	Distinguished Researcher (CIDEAGENT), IFIC-CSIC, Spain
2011-2019 (101 months)	Researcher (E13, E14), University of Bonn, Germany

#### A.3. Education

PhD	University of Valencia (Spain)	2011
Master	University of Santiago de Compostela (Spain)	2007
Physics Degree	University of Santiago de Compostela (Spain)	2005

### Part B. CV SUMMARY

I'm a CSIC's (Spanish National Research Council) staff researcher with a long-standing experience in experimental particle physics. I'm the head of the Belle II group at IFIC and Belle II upgrade coordinator at the SuperKEKB super flavor factory (Japan), with over 1000 scientists from 125 institutions of 28 countries. Having been technical coordinator and deputy run manager of the experiment, currently I am member of the Belle II Institutional, Executive, Technical and Financial boards.

During my Master Thesis at the University of Santiago de Compostela, I performed the construction, installation and commissioning of the time-of-flight detector of the DIRAC (PS212) experiment at CERN (Geneva, Switzerland).

I obtained my PhD Thesis at the University of Valencia (Spain) for the development of DEPFET sensors for the future Higgs factory and the cooling system of the Belle II pixel detector.

In 2011 I joined the Silicon Laboratory (SiLab) of the University of Bonn (Germany). During that period, I led the pixel detector developments for the Belle II experiment, doing independent research and supervising all the PhD and Master students working in the group. I have



participated in the construction of the Belle II pixel detector, being also in charge of the installation of the inner detector system and then head of the Belle II commissioning group.

As deputy run manager, I organized the Belle II experiment global data taking during first collisions. As a result of this work, the first paper of the Belle II collaboration was published, studying the beam background levels, and estimating the integrated luminosity. During this period, I joined the Belle II Technical and Executive Boards.

In 2019, I was awarded with a GenT research grant at IFIC, initiating a new research line in Spain in monolithic detectors. In 2020 I've got a Ramón y Cajal tenured contract for the Belle II vertex detector upgrade R&D. I'm the principal investigator of the Belle II group at IFIC and manage the Spanish institutional membership in the experiment. At IFIC, as staff researcher, I am leading the development of CMOS pixel sensors for future applications, being the team leader for R&D collaborations like DRD3 (CERN) and AIDAInnova WG5 from H2020 EU program. I also coordinate the solid-state detectors working group within the Spanish Instrumentation Network (CPAN-CNID).

In the last 10 years I have participated in R&D projects funded by the Generalitat Valenciana, the Spanish Ministry of Science as well as by the German BMBF. Additionally, I took part in the European projects AIDA2020, AIDAInnova and JENNIFER for detector development.

I am expert project evaluator of the European Union (EX2022D691375), of the Agencia Estatal de Investigación (AEI, Spain) and of the Iberoamerican network. I'm also reviewer in the main journal in the field (NIMA) for instrumentation papers and conference proceedings.

I have been panel member in PhD thesis (as President, Secretary or Ordinary Member) in Valencia, Barcelona and Santiago de Compostela.

I have (co-)supervised 3 PhD theses and 9 Master theses and 3 Bachelor in the last 10 years.

I have given regular instrumentation lectures in the Master program of the University of Bonn and in physics schools (IFIC Summer School, BND, JENNIFER). I have given public audience lectures (Ateneo de Santander, 2018) and interviews in newspapers (La Opinión, Faro de Vigo). I am also part of the evaluation panel of 'Sapiencia' high-school technology awards, organized by the regional universities and the government in Comunitat Valenciana.

My research activities will continue to focus on the development of semiconductor technologies for current detector upgrades and future collider experiments.

## **Part C. RELEVANT MERITS**

### **C.1. Publications**

According to Google Scholar metrics, I have 501 published articles, with 7818 total citations. The average citations per year is 868 in the last 5 years. My h and i10 indexes are 29 and 79, respectively. A selection of documents on the different detector instrumentation development activities I played a major role in during the past years is listed below.

- 'The DMAPS upgrade of the Belle II Vertex Detector'. G. Rizzo, C. Marinas et al. Nucl. Instrum. Meth. A 1072, 170164 (2025)
- 'The OBELIX chip for the Belle II VTX upgrade'. M. Babeluk, C. Marinas et al. Nucl. Instrum. Meth. A 1067, 169659 (2024)
- 'The Belle II Detector Upgrades Framework Conceptual Design Report'. H. Aihara, C. Marinas et al. arXiv:2406.19421 [hep-ex] (2024).

- 'Measurements of beam backgrounds in SuperKEKB Phase 2'. Z. Liptak, C. Marinas et al. Nucl. Instrum. Meth. A 1040 (2022), 167168
- 'Performance of production modules of the Belle II pixel detector in a high-energy particle beam'. P. Wieduwilt, C. Marinas et al. Nucl. Instrum. Meth. A 991, 164978 (2021)
- 'Effects of gamma irradiation on DEPFET pixel sensors for the Belle II experiment'. H. Schreeck, C. Marinas et al. Nucl. Instrum. Meth. A 959 (2020), 163522
- 'Radiation length imaging with high resolution telescopes'. U. Stolzenberg, C. Marinas et al. Nucl. Instrum. Meth. A 845 (2017), 173-176
- 'Integrated cooling channels in position-sensitive silicon detectors'. L. Andricek, C. Marinas et al. JINST 11 (2016) 06, P06018
- 'Physical limitations to the spatial resolution of solid-state detectors'. M. Boronat, C. Marinas et al. IEEE Trans. Nucl. Sci. 62 (2015) 1, 381-386
- 'High-voltage pixel detectors in commercial CMOS technologies for ATLAS, CLIC and Mu3e experiments'. I. Perić, C. Marinas et al. Nucl. Instrum. Meth. A 731 (2013), 131-136
- 'DEPFET active pixel detectors for a future linear e+e- collider'. O. Alonso, C. Marinas et al [DEPFET Collaboration]. IEEE Trans. Nucl. Sci. 60, 1457 (2013)
- 'Belle II Technical Design Report'. T. Abe, C. Marinas et al [Belle II Collaboration]. arXiv: 1011.0352 [physics.ins-det] (2010)

## C.2. Conferences

Listed only the most relevant oral contributions to major conferences in the last 10 years:

- 'The Belle II upgrade program'. Brookhaven Forum 2023 Advancing Searches for New Physics (BF2023) (Invited Talk).
- 'Semiconductor detectors for high radiation environments in future collider experiments'. Spanish LHC Network 2021 (Santiago de Compostela 2021). (Invited Talk).
- 'Phase II running of SuperKEKB and Belle II'. The International Conference on B-Physics at Frontier Machines (BEAUTY2018, Elba). (Plenary Talk).
- 'The Belle II Experiment'. German Physical Society (DPG2017, Münster). (Invited Plenary Talk).
- 'The Belle II Experiment'. XXIV International Workshop on Deep-Inelastic Scattering and Related Subjects (DIS16, Hamburg).
- 'Ultra-transparent DEPFET pixel detectors for future electron-positron experiments'. Third International Conference on Technology and Instrumentation in Particle Physics (TIPP2014, Amsterdam).
- 'Tracking and vertexing for the future linear collider'. European Linear Collider Workshop (ECFA-LC2013, Hamburg). (Invited Plenary Talk).
- 'DEPFET pixel detectors for future electron-positron experiments'. The European Physical Society Conference on High Energy Physics (EPS-HEP2013, Stockholm).
- 'The Belle II pixel detector: High precision with low material'. 6th International Workshop on Semiconductor Pixel Detectors for Particles and Imaging (Pixel2012, Inawashiro). (Invited Plenary Talk).
- 'The Belle II Pixel Vertex Tracker at the SuperKEKB Flavor Factory'. The 12th Vienna Conference on Instrumentation (VCI2010, Vienna). (Plenary Talk).

- 'The Belle II DEPFET Pixel Detector: A step forward in vertexing in the SuperKEKB Flavor Factory'. International Workshop on Semiconductor Pixel Detectors for Particles and Imaging (Pixel2010, Grindelwald)

- Invited physics seminars in Austria (HEPHY-Vienna), Germany (University of Freiburg, University of Bonn, Max Plank Institute for Physics Munich, University of Mainz) and Spain (IFIC-Valencia, IFCA-Santander, University of Santiago de Compostela).

- 'DEPFET active pixel detectors for a future linear collider'. ECFA detector R&D review panel 2012 and 2014. (Invited Talks)

Additionally, regular contributions to DIRAC, Belle II, DEPFET, JENNIFER, AIDAInnova and RD50 collaboration meetings not listed here.

Highlights of the main events I have organized (LOC and/or IAC):

- The 8th International Conference on Advancements in Nuclear Instrumentation Measurement Methods and their Applications (ANIMMA2025)

- CPAN Network on Instrumentation and Detectors (CNID2024)

- International Workshop on the CKM Unitarity Triangle (CKM2023)

- Belle II Physics Week (2022)

- RD50 (Radiation hard semiconductors for very high luminosity colliders) Workshop (2021)

- Forum on Tracking Detector Mechanics (2016 - 2024)

- CPIX2014 – Workshop on active CMOS Active Pixel Sensors for Particle Tracking (2014)

- Belgian Dutch German graduate school in particle physics (2012)

- International workshop on DEPFET detector and applications (2010, 2011)

### **C.3. Research projects**

Since the start of my career, I have participated in research projects funded in competitive tenders by public bodies. The main projects as principal investigator in the past 5 years are:

- Cátedra de materiales avanzados para la industria de semiconductores y circuitos integrados. (2024-2027). TSI-069100-2023-0012. 768.000 EUR.

- Outlining sensors for Future Experiments in Large radiation environments and the ITk strip upgrade of ATLAS (OFELIA). (2023-2025). PID2021-126327OB-C21. 605.000 EUR.

- Large area DMAPS for future colliders. (2023-2025). CNS2022-135606. 199.527 EUR.

- Monolithic sensors for New Physics searches (MOSES). (2022-2025). ASFAE/2022/016. 203.719 EUR.

- Ultralight pixel detectors for New Physics searches in the flavor sector at the Belle II experiment. (2022-2027). RYC2020-029875-I. 324.250 EUR.

- Advanced pixel detectors for future colliders. (2019-2022). (CIDEAGENT/2018/020). 367.954 EUR.

- AIDAInnova. Advanced and Innovation for Detectors and Accelerators. European Union. (2020-2024). Leading scientist WP5 (DMAPS) at IFIC (31.250 EUR).