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CURRICULUM VITAE

CV date	07/02/23

Part A. PERSONAL INFORMATION

First name	Ana		
Family name	Pérez Rodríguez		
Gender (*)	Female	Birth date (dd/mm/yyyy)	06/04/1987
Social Security, Passport, ID number	52985322-S		
e-mail	ana.perez.rodriguez.c@gmail.com	URL Web	
Open Researcher and Contributor ID (ORCID) (*)		https://orcid.org/0000-0002-5778-0103	

(*) Mandatory

A.1. Current position

Position	Postdoctoral researcher		
Initial date	01/04/2021		
Institution	Universidad de Salamanca (USAL)		
Department/Center	Facultad de Físicas, Departamento de Física Fundamental		
Country	España	Phone number	687833363
Key words	photovoltaics; 2D materials, semiconductor devices, nanotechnology		

A.2. Previous positions (research activity interruptions, see call)

Period	Position/Institution/Country/Interruption cause
19/03/2019-31/03/2021	Postdoctoral researcher/ International Iberian Nanotechnology Laboratory/Portugal
01/05/2013-16/04/2018	Phd Student/ Materials Science Institute of Barcelona (ICMAB-CSIC) / Spain
15/09/2015-31/10/2015	Visiting researcher at Lichttechnisches Institut, Karlsruher Institut für Technologie, Karlsruhe, Germany
01/05/2014-15/06/2014	Visiting researcher at Lichttechnisches Institut, Karlsruher Institut für Technologie, Karlsruhe, Germany

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Materials Science	Universitat Autònoma de Barcelona / Spain	2018
Master in Photovoltaic Solar Energy	Universidad Politécnica de Madrid/ Spain	2012
Degree in Physics	Universidad Autónoma de Madrid / Spain	2011

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

I work as a postdoctoral researcher at the Nanotechnology group, led by Prof. Enrique Díez, in the University of Salamanca (USAL). My research line is focused on the development and characterization of **bidimensional semiconductor-based devices**, more specifically **solar cells, photodetectors and field effect transistors** based on Transition metal dichalcogenides (TMDs) and other 2D materials. I have published **15 papers (3 as a first author)** in diverse peer-reviewed, high-impact (10 articles Q1, including one publication with IF>30 in **Energy & Environmental Science** and 4 articles Q2) journals, a conference proceeding as a **corresponding author** and a **book chapter**. I have devoted research career to study the correlation of the phenomena **occurring at the nanoscale** with the **macroscopic performance** of **semiconductor-based devices**. My research has significantly contributed to establish new areas of study at the Nanotechnology group, including a new line on surface characterization of bidimensional devices, and to bring new collaborations with relevant groups in the field.

I have presented my work in more than **12 international conferences** in the form of oral communications and scientific posters and in different **outreach** activities (STEM mentoring program, and Pint of Science among others). I have been member of the organising committee in the GEFES 2023

summit, and I have contributed to early-stage researchers with the supervision of 1 master and 3 undergrad students at INL and 1 undergrad student at USAL on bidimensional semiconductor devices.

I completed my PhD in the Physical Chemistry of Surfaces and Interfaces group at the Institute of Material Science of Barcelona under the supervision of Dr. Esther Barrena and Prof. Carmen Ocal focused on the **impact of the structural and electronic properties at the nanoscale on the electronic performance of macroscopic thin film devices**. My thesis dissertation was awarded with Cum Laude, International PhD mention and **Special Award for Doctoral Studies**. Within my PhD project but also through numerous collaborations I gained a solid background in **designing and fabricating organic and inorganic semiconductor-based devices in the micro and nano-scale** and the characterization of both their nanoscale properties and their macroscopic performance. During this time, I had the chance to visit relevant **international laboratories**, in a research stay in **KIT (Karlsruhe**) and **synchrotron beamlines** (France, Germany, Spain). My work on those topics lead to several publications in **high impact journals** (such as Energy & Environmental Science, IF=30.28) that accumulate ≈**130 citations**. I also gained large expertise in surficial characterization methods, publishing works in Q1 journals such as **Nanoscale, Journal of Materials Chemistry A and ACS applied materials & interfaces, that accumulate ≈160 citations**.

Afterwards, as a postdoctoral researcher at the Laboratory for Nanostructured Solar Cells (LaNaSC) at INL (Portugal) lead by Dr. Sascha Sadewasser, I was the **main investigator in a FCT founded project** developing CIGSe micro-concentrator solar cells, which allowed me to expand my materials growth and characterization at the nanoscale knowledge with wide range of techniques such as magnetron sputtering, and with all the processes involved in the **design and fabrication of solar cells stacks in the sub-millimetre range in Cleanroom facilities**. The project was successful, leading to one publication in **Materials & Design, a review paper in Journal of Physics: Energy and a AIP conference proceedings.** I moved to Salamanca to become a postdoctoral researcher in the Nanotechnology group (Universidad de Salamanca, USAL), under the supervision of Prof. Enrique Diez Fernandez, where I am working on the **development of bidimensional photodetectors, field effect transistors and solar cells based in TMDs and other bidimensional materials, by performing a thorough nanoscale characterization of their most relevant and critical interfaces**. In 2022, my project 2DSolcel was awarded with **a MSCA Cofund individual fellowship** within the USAL4Excellence program, starting in April 1st. This project consists of developing a methodology to perform a thorough nanoscale characterization of 2D materials-metals interfaces, with the aim of providing insight into the interfacial phenomena and mechanisms that **hinder the performance of 2D materials-based devices** and developing **efficient bidimensional solar cells**. Through this project and my ongoing collaborations with photovoltaics relevant groups, I am becoming a **leading scientist in the fast-growing field of 2D photovoltaics**. Moreover, my expertise in the nanoscale characterization is situating me in a very relevant position, allowing me to play a fundamental role within this community. Moreover, as a member of the Department of Fundamental Physics, I have an active role as a lecturer and official supervisor of undergrad and masters' projects of USAL students.

Part C. RELEVANT MERITS

C.1. Publications

1. **Scientific paper** Juan Salvador-Sánchez, Luis M Canonico, Ana Pérez-Rodríguez *et al.* (3/18), 2023, Generation and control of non-local chiral currents in graphene superlattices by orbital Hall effect, arXiv, 2206.04565v1 **, under revision in Nature Communications**
2. **Scientific paper**., Ricardo G Poeira, Ana Pérez-Rodríguez (**shared first coauthorship**), JC Aubin, *et al.* (1/5), 2023. Direct fabrication of arrays of Cu(In,Ga)Se2 micro solar cells by sputtering for micro-concentrator photovoltaics Materials & Design, vol 225, 111597. DOI: 10.1016/j.matdes.2023.111597.
3. **Scientific paper**. Daniel Brito, Ana Pérez-Rodriguez, *et al.* (2/9), 2022,. Effect of gallium doping on structural and transport properties of the topological insulator Bi2Se3 grown by molecular beam epitaxy. Journal of Applied Physics A. vol 132, 115107. DOI: 10.1063/5.0107004
4. **Conference proceeding**. Ana Pérez-Rodríguez **(first and corresponding author)**, Ricardo G Poeira, Marina Alves, *et al.* (1/5), 2022, Current status of bottom-up fabrication approaches for Cu(In,Ga)Se2 micro-concentrator solar cells, AIP Conference Proceedings 2550, 060005, DOI: 10.1063/5.0104440
5. **Scientific paper** Jordi Martínez-Esaín, Ana Pérez-Rodríguez, Jordi Faraudo *et al*. (2/7). 2022.

Real-Space Image of Charged Patches in Tunable-Size Nanocrystals. Materials (MDPI), vol 15,4, 1455. DOI: 10.3390/ma15041455

6 **Scientific paper**. Ilario Gelmetti, Núria F Montcada, Ana Pérez-Rodríguez *et al*. (3/10). 2019. Energy alignment and recombination in perovskite solar cells: weighted influence on the open circuit voltage, Energy & Environmental Science, vol 12, 1309-1316. DOI: 10.1039/C9EE00528E

7 **Scientific paper**. Ana Pérez Rodríguez; Inés Temiño; Carmen Ocal *et al*. (1/6). 2018. Decoding the vertical phase separation and its impact on C8-BTBT/PS transistor properties, ACS Applied Materials & Interfaces, vol 10, 7296-7303, DOI: 10.1021/acsami.7b19279

8 **Scientific paper**. Ana Pérez Rodríguez; Esther Barrena Villas; Antón Fernández; (1/5) 2017. A molecular-scale portrait of domain imaging in organic surfaces, Nanoscale, vol 9, 5589-5596, DOI: 10.1039/C7NR01116D

9 **Scientific paper**. Cordula D. Wessendorf; Ana Pérez Rodríguez; Jonas Hanisch (2/12). 2016 Understanding the Effect of Solvent Vapor Annealing on Solution-Processed A-DA Oligothiophene Bulk-Heterojunction Solar Cells: the Role of Alkyl Side Chains. Journals of Materials Chemistry A, Vol 4. 2571-2580, DOI: 10.1039/C5TA07713C

10 **Book chapter.** Esther Barrena Villas; Felix Buss; Ana Pérez Rodríguez; (3/8), 2017. In situ Studies of Morphology Formation in Solution-Processed Polymer–Fullerene Blends: Advances in polymer science Springer 2017, 10.1007/978-3-319-28338-8_1, ISBN 978-3-319-28338-8

C.2. Congress

1 *Effect of Gallium doping on structural and transport properties of the topological insulator bi2se3 by molecular beam epitaxy*. GEFES,. Salamanca, SPAIN, **Poster contribution.**

2 *Cu(In,Ga)Se2 micro-concentrator solar cells fabricated by sputtering and post-selenization. Virtual Chalcogenide PV conference*. May 2020. Online. **Oral short (poster) contribution.**

3 *A molecular-scale portrait of domain imaging in organic surfaces*. GEFES 2021. January 2018, SPAIN **Oral contribution**

4 *Quantifying the vertical phase separation in BTBT-C8:PS OFETS and its influence on the electrical performance*. E-MRS Spring Meeting May, 2017, France. **Oral contribution**

5 *Engineering the interface of polymer solar cells.* Organic Electronics: Recent Developments and Challenges, June, 2016, Germany, **Oral contribution**.

6 *Nanoscale characterization of organic field-effect transistors (OFETs) by Scanning Kelvin Probe Force Microscopy,* Fuerzas y Túnel, September 2016, Spain, **Oral contribution**.

7 *Understanding domain orientation mapping of polycrystalline organic semiconductor films by transverse shear microscopy*, Self2016, June 2016, Spain **Oral contribution**.

8 *Effects of ITO functionalization by self assembled monolayers in high efficient polymer solar cells*, JPHD2015 students meeting, 2015 Spain, , **Oral contribution**

9 *Effect of solvent annealing and ITO functionalization by self-assembled monolayers in high efficient organic solar cells*, E-MRS Spring Meeting, May 2015, France, **Oral contribution**

10 *Effects of ITO functionalization by self-assembled monolayers in high efficient polymer solar cells.* Organic Electronics Meeting at ICMAB (ORGI 2015), November 2015, **Oral contribution**

C.3. Research projects

1 *Platform for fast screening of materials for 2d solar cells (2DSolcel)*. Universidad de Salamanca (USAL)/ Comisión Europea (MSC-COFUND). Ana Pérez-Rodríguez (Co-PI), Enrique Díez (PI) (Nanotechnology group-USAL). 01/04/2023-31/10/2025. 145.650 € - **Role: project leader**

2 *Correlated nanoscale characterization by Atomic Force Microscopy and electronic properties in semiconducting) two-dimensional Metal-Organic Frameworks (2DNanoMof)* Comisión Europea (MSCA-IF). Enrique Cánovas (PI), Ana Pérez-Rodríguez (Co-PI), **Role: project leader. Awarded in February 2022, declined by applicant.**

3 *Nanoscale correlation of structure and electronic properties in semiconducting two-dimensional Metal-Organic Frameworks. (Na2MOFs)* IMDEA Nanociencia/ Comisión Europea (MSC-COFUND) Ana Pérez-Rodríguez (Co-PI), Enrique Cánovas. (PI) **Role: project leader. Awarded in June 2022, declined by applicant.**

4 *Brosynano: experimental study of tunable spin and valley degeneracy in broken-symmetry nanosystems*. Ministerio de Ciencia, Innovación y Universidades. PID2019-106820RB-C22 01/2010-12/2022.: Mario Amado Montero y Enrique Diez Fernández PIs-coordinators

156.090,00 €, **Role: postdoctoral researcher.**

5 *MiconCell – Micro-concentrator thin film solar cells*. Sistema de Apoio à Investigação Científica e Tecnológica (SAICT)- Projetos de Investigação Científica e Desenvolvimento Tecnológico (IC&DT). 2018-2021. Sascha Sadewasser. Rúben Filipe da Silva Santos PIs-coordinators 234, 523.23€, **Role: main researcher.**

6 *Quiralidad supramolecular en bajas dimensiones y transporte de carga: estructura y foto-respuesta.* MAT2013-47869-C4-1-P. Ministerio de Ciencia, Innovación y Universidades. 01/01/2015-31/12/2018. Carmen Ocal García PI coordinator. 114.285,00 €. **Role: predoctoral full time researcher.**

7 *Suport a Grupos de recerca emergents (GRE).* 2014 SGR 501. Generalitat de Cataluña. **2014-2016** Carmen Ocal García PI coordinator. 10000 €. **Role: predoctoral full time researcher.**

8 *Polymeric Solar Cells: Molecular Orientation, Structure, and Optoelectronic Performance (PSOP).*: BA 3772/1-3 Deutsche Forschungsgemeinschaft (DFG). 05/2013-05/2015. Esther Barrena PI. 88.470 EUR €. **Role: predoctoral full time researcher.**

C.4. Contracts, technological or transfer merits

1 ***USAL4Excellence COFUND programme:*** I was granted with a competitive senior postdoctoral fellowship from the MSCA COFUND programme USAL4Excellence whose project involves an industrial partner (Iberdrola). During the project, starting April 1st, I will fabricate and optimize (1) a testing platform for bidimensional materials and (2) different configuration 2D solar cells based on TMDs and other bidimensional materials. A 4 months secondment in Iberdrola (Global Smart Grids Innovation Hub division) will be done in order to study the economic viability of the large-scale fabrication and commercialization of the designed test platform for research applications and solar cells. This secondment has a strong focus on knowledge transfer and I will introduce the results of the project, focusing on potential commercialization through a technology transfer to the industry study. Moreover, the product-oriented research of this project will allow me to learn about microfabrication protocols related to device fabrication and its integration in larger systems. This know-how will provide me with strong competences on economic viability and device manufacturing beyond lab scale.

2 **Outreach activities:** |1] Outreach talk aimed at teaching high school students students about Nanotechnology, 31/01/2023, as a part of the GEFES conference [2] Participation in the STEM Talent Girl mentor program. As a part of the program, I am a mentor of a 17-year-old girl, with who I regularly meet to discuss careers in STEM and I organize and lead, Shadowing sessions, with high school girls interested in STEM Starting date 10/2021, ongoing. [3] "Pint of Science" (2015, 2017) Talk for the general public entitled *Nanoscience, how to move atoms?* [4] Recurrent participation in the theater play

3 **Conference organization:** January 2023: member of the organizing committee of XII Reunión del grupo de física de la materia condensada de la RSEF – GEFES 2023 held in Salamanca on February 1-3, 2023.

4 **Member of scientific societies**: [1] Senior member of Real Sociedad Española de Física (RSEF) and [2] Grupo Especializado de Física del Estado Solido (GEFES).

5 **Member of thesis committee:** I have been invited to participate (and officially designed) as a member of the thesis defence committee of PhD candidate José Virtuoso, supervised by Dr. Sascha Sadewasser at INL. The thesis will be held in March 2023.