MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE ABREVIADO (CVA)

***IMPORTANT** – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.*

Part A. PERSONAL INFORMATION

First name	David		
Family name	Navas Otero		
Gender (*)	male	Birth date	14/04/1976
ID number	46832175N		
e-mail	david.navas@csic.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-2044-486X	

(*) Mandatory

A.1. Current position

Position	Researcher (Dr. Fuera de Convenio)		
Initial date	01/08/2022		
Institution	CSIC		
Department/Center	Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC)		
Country	Spain	Teleph. number	(0034) 647145770
Key words	Nanostructured materials, Nanomagnetism, magnetization dynamics		

A.2. Previous positions (research activity interuptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
2019-2022	**Ramon y Cajal Researcher** (RYC-2017-22820) at Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Spain
2014-2019	**FCT Researcher** (IF/01191/2013) at Universidade do Porto (UP), Portugal
2013-2014	**Postdoctoral fellowship FCT** (SFRH/BPD/89808/2012) at Universidade do Porto (UP), Portugal
2010-2013	Postdoctoral fellowship JCI-2009-05571 (**Juan de la Cierva**) at Universidad del País Vasco (UPV-EHU), Spain
2007-2009	Postdoctoral fellowship FU2006-1156 (**MEC/FULBRIGHT**) at Massachusetts Institute of Technology (MIT), USA
2002-2006	Predoctoral fellowship (**FPU**) at Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Bachelor in Physics Science	Universidad Autónoma de Madrid (Spain)	2002
PhD in Physics Science	Universidad Autónoma de Madrid (Spain)	2006

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

My research line is focused on the field of Nanomagnetism which deals with magnetic phenomena on short length-scales and in low dimensional systems.
In 2002, I started my research activity at the Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), under the supervision of Prof. M. Vázquez and Prof. M. Hernández-Velez. I worked on *the preparation and characterization of well-ordered electrodeposited nanowire arrays into porous anodic alumina templates and free-standing ferromagnetic antidot arrays.* During this stage, I set up and improved the 1st laboratory in Spain for the preparation of nanoporous anodic alumina and nanowire arrays.
Also, I visited international laboratories, such as 9 months at the Max Planck Institute of Microstructure Physics (Halle, Germany), in order to broaden my scientific knowledge and experimental capabilities.
Afterwards, I joined the Material Science and Engineering Department at the Massachusetts Institute of Technology (MIT, EEUU) under the supervision of Prof. C.A. Ross for a 2-years postdoctoral stay. In this stage, I improved my skills on the fabrication and characterization of

artificially nanostructured films by using top-down processes, such as lithography and RF sputtering techniques, and magnetic imaging methods (Magnetic Force Microscopy). *My work was focused on the study of ferromagnetic nanostructured materials with perpendicular anisotropy, such as CoCrPt, and their possible application as a new generation of high-density magnetic memories*.
In June 2009, I moved to the Spectroscopy Group at Universidad del País Vasco (UPV/EHU), under the supervision of Prof. F. Castaño for *the set up and improvement of a laboratory for the fabrication and characterization of magnetic nanostructures*.
During this stage, I have led a new research line in the UPV/EHU group, based on *the study of the magnetic behaviour of ferromagnetic thin films through the thickness of the nanostructures using Polarized Neutron Reflectivity measurements (PNR)* at Institut Laue-Langevin (ILL, Grenoble-France).
In April 2013, I joined the Instituto de Fisica dos Materiais da Universidade do Porto (IFIMUP). My research interest has been focused on *understanding dynamical processes such as magnetization reversal dynamics and domain wall motion*. During this stage, I worked on the *set up and improvement of an ultrafast pump-probe system for understanding the ultrafast dynamical behavior of magnetic and magnetoplasmonic nanostructures.*
Since June 2019, I work at the ICMM-CSIC. I first worked as a Ramón y Cajal Researcher and, since August 2022, I have a permanent researcher contract. Combining my scientific background on fabrication and characterization techniques of magnetic and magnetoplasmonic nanostructures, I am interested in preparing nanostructures, with reduced feature sizes, complex morphologies and tailored properties, which could be useful for a range of applications like data storage, energy and bio-medical applications.
During my research carrier, I have an active participation in 22 projects. Among all of them, I was/am the project co-leader of 1 project at Porto University, leader of 4 projects at Porto University and 2 at ICMM-CSIC (Total: 7 projects). In summary, I have obtained more than 750,000 euros (without considering my salary). Moreover, and as I initiated a research line based on the study of ferromagnetic thin films, multilayers and nanostructured systems by PNR, I got financial support from ILL to perform 9 postdoctoral stays (5 as Project leader).
Regarding supervision of students, I have co-supervised 1 Master Thesis and 2 Doctoral Thesis (+ 1 Doctoral Thesis which is in progress). I have participated 12-times as a thesis tribunal member (7 as main member + 5 as substitute member).
I have worked as a project evaluator for the Chilean National Commission for Scientific and Technological Research (CONICYT, **1-time** in 2018) and the Agencia Estatal de Investigación (AEI, **2-times** in 2021).
I have worked 6-times in the organization of Scientific Events such as a Member of the Organizing Committee for the *3rd Brillouin Meeting* Porto (Portugal, September 2019) and the *European Magnetic Sensors and Actuators Conference* (EMSA 2022, Madrid, Spain, July 2022.).
I have been also invited to participate in science dissemination events such as the "*Symposium MIT and Portugal in the challenges for the Planet and the Society*", at Minho University (Portugal, February 2018), and the European Commission activity "Science is Wonderful!" event in Brussels (Belgium, September 2019).
In summary, my scientific work has been presented *109-times* in *International conferences* with *21 invited + 48 oral talks*. I published *3 book chapters* and *63 scientific papers* in various peer-reviewed international journals. It has been cited *more than 1600 times* (2200 Google Scholar) and my *h-factor* is *24* (28 Google Scholar).

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications (**63** publications and **3** Book chapters)

10) A. Ruiz-Clavijo, O. Caballero-Calero, **D. Navas**, A. A. Ordoñez-Cencerrado, R. Sanz (AC) and M. Martín-González (AC). *Unveiling the complex magnetization reversal process in 3D Nickel Nanowire Networks*, Advanced Electronic Materials, 2200342 (2022).

9) **D. Navas** (AC), D. G. Trabada and M. Vázquez. *Nanoimprinted and anodized templates for large-scale and low-cost nanopatterning*, Nanomaterials, 11, 3430 (2021).

8) A. S. Silva, S. P. Sá, S. Bunyayev, C. Garcia, I. J. Sola, G. Kakazei, H. Crespo and **D. Navas** (AC). *Dynamical behaviour of ultrathin [CoFeB (tCoFeB) / Pd] films with perpendicular magnetic anisotropy*, Scientific Reports, 11, 43 (2021).

7) **D. Navas**, R.V. Verba, A. Hierro-Rodriguez, S.A. Bunyaev, X. Zhou, A.O. Adeyeye, O.V. Dobrovolskiy, B.A. Ivanov, K.Y. Guslienko and G.N. Kakazei (AC). *Route to form skyrmions in soft magnetic films*, APL Materials, 7, 081114 (2019).

6) **D. Navas** (AC), N. Soriano, F. Beron, C. T. Sousa, K. R. Pirota, J. Torrejon, C. Redondo, R. Morales and C. A. Ross. *Microscopic reversal magnetization mechanisms in CoCrPt thin films with perpendicular magnetic anisotropy: fractal structure vs labyrinth stripe domains*, Physical Review B Rapid Communications, 96, 180403(R) (2017).

5) **D. Navas** (AC), L. Bi, A.O. Adeyeye and C.A. Ross. *Templates as Shadow Masks to Tune the Magnetic Anisotropy in Nanostructured CoCrPt/Ti Bilayer Films,* Adv. Mater. Interfaces, 2, 1400551 (2015).

4) R. Morales, Ali C. Basaran, J. E. Villegas, **D. Navas**, N. Soriano, B. Mora, C. Redondo, X. Batlle, and Ivan K. Schuller. *Exchange-Bias Phenomenon: The Role of the Ferromagnetic Spin Structure,* Phys. Rev. Lett., 114, 097202 (2015).

3) **D. Navas** (AC), C. Redondo, G.A. Badini Confalonieri, F. Batallán, A. Devishvili, O. Iglesias-Freire, A. Asenjo, C.A. Ross and B.P. Toperverg, *Domain-wall structure in thin films with perpendicular anisotropy: Magnetic force microscopy and polarized neutron reflectometry study*, Phys. Rev. B, 90, 054425 (2014).

2) **D. Navas** (AC), J. Torrejón, F. Béron, C. Redondo, F. Batallán, B.P. Toperverg, A. Devishvili, B. Sierra, F. Castaño, K.R. Pirota and C.A. Ross. *Magnetization reversal and exchange bias effects in hard/soft ferromagnetic bilayers with orthogonal anisotropies*, New Journal of Physics, 14, 113001 (2012).

1) **D. Navas** (AC), M. Hernández-Vélez, M. Vázquez, W. Lee and K. Nielsch. *Ordered Ni nanohole arrays with engineered geometrical aspects and magnetic anisotropy*, Appl. Phys. Lett., 90, 192501 (2007).

C.2. Congress (***109-times*** *International conferences* with ***21 invited*** + ***48 oral talks*** + ***40 posters***)

6). S. Moraes, D. Navas et al., *Tuning the magnetic behaviour of Fe/Cu electrodeposited nanowires with controllable Fe and Cu*. (***Oral Invited***)
Conference: Join European Magnetic Symposia (JEMS 2020), Virtual Conference, December 2020.
5) D. Navas et al., *Ultrafast Magnetization Dynamics of CoFeB-based multilayer thin films with perpendicular anisotropy.* (***Oral Invited***)
Conference: The 10th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 2019), Lisbon (Portugal), July 2019.
4) D. Navas et al., *Ferromagnetic antidot arrays with complex geometries*. (***Oral***)
Conference: 65th Annual Conference on Magnetism and Magnetic Materials (MMM-2020), Virtual Conference, November 2020.
3) D. Navas et al., *Reversal processes in CoCrPt thin films and pseudo-spin-valves with perpendicular magnetic anisotropy*. (***Oral***)
Conference: The 2019 Joint MMM-Intermag Conference, Washington, DC (USA), January 2019.
2) D. Navas et al., Formation of skyrmions in soft magnetic films without DzyaloshinskiiMoriya interaction. (***Oral***)
Conference: The 2019 Joint MMM-Intermag Conference, Washington, DC (USA), January 2019.
1) D. Navas et al., *New low-cost approach for solar-cells based on magnetoplasmonic nanostructures.* (***Oral Invited***)

Conference: MIT-Portugal 2018 Annual Conference, Lisbon (Portugal), October 2018.

C.3. Research projects

During my research carrier, I have an active participation in 22 projects funded by different organisms (European Union, Spanish Ministry of Science, industry, MIT, ILL, Fundação para a Ciência e a Tecnologia, …). Up today, I was/am the project leader/co-leader of 7 projects:

7) *Novel magnetic nanostructures for medical applications* supported by Marie Sklodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2016)
Total Budget: ***846.000€*** Partial Budget: ***40.000 €***
Proj. leaders: Dr. R. Morales (UPV-EHU, Spain) (Coordinator),
Dr. David Navas (ICMM-CSIC) April 2017 – May 2023

6) *Dynamical properties of nanostructured ferromagnetic and magneto-plasmonic materials* supported by Ministrio de Ciencia Innovación y Universidades (RYC-2017-22820).
Budget: ***40.000 €***
Proj. Leader: **Dr. David Navas** June 2019 – June 2024

5) *Dimensionality effects in the physical properties of Heusler and magnetostrictive intermetallic materials: From 1- to 3-D architectures* supported by Fundação para a Ciência e a Tecnologia (PTDC/FIS-MAC/31302/2017). Budget: ***221.432,68 €***
Proj. Leader: **Dr. David Navas** July 2018 – June 2021

4) *Isolated attosecond pulses on a tabletop: measuring and controlling extreme ultrafast dynamics in matter* supported by Fundação para a Ciência e a Tecnologia (PTDC/FISOTI/32213/2017). Budget: ***239.347,75 €***
Proj. Leader: Prof. Helder Crespo / **Dr. David Navas** July 2018 – June 2021

3) *New low-cost approach for solar-cells based on magnetoplasmonic nanostructures* supported by Fundação para a Ciência e a Tecnologia through the MIT Portugal Program (MIT-EXPL/IRA/0012/2017) Budget: ***99.725 €***
Proj. Leader: **Dr. David Navas** September 2018 – August 2019

2) *Dynamics in nanostructured magnetoplasmonic materials: Generation and Control* supported by Fundação para a Ciência e a Tecnologia (FCT) Budget: ***50.000 €***
Proj. Leader: **Dr. David Navas** February 2014 – January 2019

1) *Coupling effects in magnetic patterned nanostructures* supported by Mary Curie Actions: International Research Staff Exchange Scheme (FP7-PEOPLE-2012-IRSES)
Total Budget: ***323.400 €*** Partial Budget: ***36.000 €***
Proj. leaders: Dr. R. Morales (UPV-EHU, Spain) (Coordinator)
Dr. David Navas (Universidade do Porto) January 2012 – December 2016

C.4. Contracts, technological or transfer merits

Contracts: During my research activity, I have been awarded with 8 competitive fellowship/contracts (of a total of 9) such as the MEC/FULBRIGHT post-doctoral fellowship, Juan de la Cierva contract and Ramón y Cajal contract supported by the Spanish government, as well as the FCT post-doctoral fellowship and FCT research contract supported by the Portuguese government.

Patents*:* Title registered industrial property: *Method for combined soft litographic imprint and anodization of aluminium (*European Patent: *EU patent PCT/EP2020/066600)*
Inventors/authors/obtainers: Manuel Vazquez Villalabeitia, David Gonzalez Trabada and David Navas Otero
Institutions: Consejo Superior de Investigaciones Científicas (CSIC, Spain) and Universidade do Porto (UP, Portugal)