

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	Ana Maria		
Family name	Palau Masoliver		
Gender	Female	Birth date	09/02/1976
ID number	43630499M	https://icmab.es/superconducting/superqmat	
e-mail	palau@icmab.es		
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-2217-164X	

A.1. Current position

Position	Tenured scientist		
Initial date	19/07/2008		
Institution	Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)		
Department/Center	Superconducting Materials and Functional Nanoengineered Structures		
Country	Spain	Telephone number	+34 935801953 (436159)
Key words	superconductivity, magnetism, strongly correlated oxides, nanostructures, metamaterials, quantum materials, spintronics		

A.2. Previous positions

Period	Position/Institution/Country/Interruption cause
2007 - 2008	Ramón y Cajal Researcher / ICMAB-CSIC / Spain
2006 - 2007	Post Doctoral Researcher (Beatriu de Pinos) / University of Cambridge / UK
2005 - 2006	Post-Doctoral Researcher (Associate Post-Doc) / University of Cambridge / UK

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD. Material Science	Universitat Autònoma de Barcelona / Spain	2000-2005
Materials Engineer	Universitat Politècnica de Catalunya/ Spain	1998-2000
Bachelor of Physics	Universitat de Barcelona / Spain	1994-1999

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

Graduate in Physics and Materials Engineering. PhD in Materials Science. Post-doctoral stay at the University of Cambridge, UK (2005-2007). Ramon y Cajal ICMAB-CSIC (2007).

In 2008 I obtained the position of Tenured Scientist at ICMAB, where **I am leading a research group** focused on the study of High Temperature Superconductors (HTS) for Sustainable Information and Communication Technologies (S-TIC). (<https://icmab.es/superconducting/anna-palau-group>). Group members: 5 Pre-Doc, 1 Master Student, 1 TFG students. Group funding: I am the PI of 3 active projects: PID2021-HTSUPERFUN (193,600€), TED2021-MAGNETOLIGHT (178,250€) and CHISTERA-MetaMagIC (1,066,802€, 206.319€ (ICMAB)) of which I am the coordinator. I participate in 2 networks COST-SUPERQMAP (management committee) and RED2022-NANOLITO (IP ICMAB). I am the coordinator of the Challenge “Quantum coherence phenomena for new sensor and devices” of the ICMAB research line “Materials for electronics” (<https://www.icmab.es/m4elc>).

My research career has evolved in the field of superconducting materials and functional oxides. I have explored both the fundamental physical phenomena that determine their electrical and magnetic properties, as well as their potential applications. My research objectives primarily focus on two main areas of study related to high temperature superconductors (HTS).

1- Study of high-temperature superconducting tapes (HTS) for power applications

I began working in this field during my PhD, studying vortex matter in superconducting tape. After my post-doc, I continued this research as the PI of the ICMAB for the EUROfusion project. (2019-2021), 150,000€ (Total 619,349€), aimed at the optimization of tapes for Fusion, in collaboration with G. Celentano, ENEA, Italy, E. Silva, Roma TREE, Italy, T. Petrisor, TUCN, Romania. In this line, it is

worth highlighting the discovery of two new types of vortex mechanisms: using nano-tensions [Llordés, Palau et al. Nat. Mat. 2012, 289 citations, 24.1c/y], magnetic particles [Palau* et al. PRL 2007, 44 citations, 2.6 c/y], and a study of vortex pinning mechanisms in YBCO films [Palau*, SUST 2018, 49 citations, 8.2c/y], selected as featured by the editors based on their novelty and scientific impact,

2- Exploration of new strategies for the design of functional devices based on HTS

I started the activity in this line, focused on exploring frontier materials: quantum systems, HTS, hybrids or metamaterials to realise functional, energy-efficient devices based on Fluxonics, Spintronics and “Motttronics” during my Post-Doc [Palau* et al. PRL 2006, 46 citations, 2.5c/a]. I am currently leading this area at ICMA, where I established strong **collaborations with researchers from leading national and international institutions and co-authored** multiple publications. **A.Silhanek**, U. Liege, Belgium [Marinkovic..., Palau*, Silhanek*, ACS Nano 2020, 15 citations, 4 c/y], **J.Biegert**, ICFO, Barcelona [Alcalà et al, PNAS 2022, 34 citations, 17c/i], **S.Valencia**, BESSY, Berlin [Palau* et al. Adv. Sci. 2016, 12 citations, 1.5c/y], **J.M.de Teresa**, INMA, Zaragoza [Rouco..., Palau*. Sci Rep. 201, 19 citations, 2.7c/a 7], **J.Suñé**, UAB, Barcelona [Palau* et al. ACS Appl. Mater. Interf. 2018, 20 citations, 3.3c/y], **F.Tafari**, U. Federico II, Naples [Rouco..., Palau*, NanoLett. 2019, 11 citations, 2.2c/y], **V.Uhlir**, Brno, Czech Rep., **S.Bending**, Bath, UK, [Lejeune et al. APL Materials, 2024]. **J. Sort**, UAB, Spain [Spasojevic et al. Nature Communications, 2025 (in press)].

Co-author of **120 publications** (80.4% in the top 25% journals by CiteScore, 44.8% in the top 25% most cited documents worldwide, 65.5% co-authored with researchers in other countries, 72 % Q1), **2863 citations, h index=30 (WoS), h=33, i10=91 (G. Scholar), 5 book chapters, 3 patents. Co-editor of the book** “Superconductivity: From Materials Science to Practical Applications”. Participation in **34 scientific projects (10 as IP)** (11 European, 15 National and 8 Regional). I have **supervised 11 PhD Theses** (5 in progress and 6 completed (all with Post-Doc or Scientific Technician positions), 10 Masters (1 in progress), 21 Final Degree Projects (1 in progress). I have given **37 invited, 20 oral and 14 presentations** at seminars or courses. I have performed 11 stays in research centres or large facilities. **Member of the organising committee of 3 symposia** at international conferences and several schools and workshops. **Member of the editorial board of 4 scientific journals**. Member of the evaluation committee of 10 Theses and Expert Evaluator of National and EU Projects. Member of 2 evaluation committees of National projects and the **panel of experts at Research Foundation Flanders** (Belgium). Dissemination activities on social networks (YouTube videos, outreach interviews).

Part C. RELEVANT MERITS

C.1. Publications

CA: Corresponding Author; (n° x/ n° y): applicant research position / total authors; citations; citations/year; IF: Impact Factor 5 years. (according to WoS)

1. A. Barrera, E. Fourneau, N. Bort-Soldevila, J. Cunill-Subiranas, N. Del-Valle, N. Lejeune, M. Stano, A. Smekhova, N. Mestres, L. Bacells, C. Navau, V. Uhlir, S. Bending, S. Valencia, A. Silhanek, A. Palau (CA), *On-Chip Planar Metasurfaces for Magnetic Sensors with Greatly Enhanced Sensitivity*. **ACS Nano** 10461 (2025) doi.org/10.1021/acsnano.5c00422, IF 16.0
2. T. Gunkel, J. Alcalà, A. Fernández, A. Barrera, Ll. Balcells, N. Mestres, E. Miranda, J. Suñé, A. Palau (CA), *Field-Induced Phase transitions in Cuprate Superconductors for Cryogenic in-Memory Computing*, **Small** 2411908 (2025). DOI 10.1002/sml.202411908. IF: 12.1
3. N. Lejeune, E. Fourneau, A. Barrera, O. Morris, O. Leonard, J.A. Arregi, C. Navau, V. Uhlir, S. Bending, A. Palau (CA), A.V. Silhanek (10/11). *Dimensional crossover of microscopic magnetic metasurfaces for magnetic field amplification*. **APL Materials** 12, 071126 (2024). DOI: 10.1063/5.0217500. IF: 5.5
4. J. Alcalà, A. Fernández-Rodríguez, T. Gunkel, A. Barrera, M. Cabero, J. Gazquez, Ll. Balcells, N. Mestres, A. Palau (CA) (9/9). *Tuning the superconducting performance of YBa₂Cu₃O_{7-δ} films through field-induced oxygen doping*. **Scientific Reports** 14, 1939 (2024). DOI: 10.1038/s41598-024-52051-1. 1 citation, 1c/y, IF: 4.3
5. J. Alcalà, U. Bhattacharya, J. Biegert, M. Ciappina, U. Elu, T. Graß, P. T. Grochowski, M. Lewenstein, A. Palau, T. Sidiropoulos, T. Steinle, I. Tyulnev (Authors in alphabetical order). *High-harmonic spectroscopy of quantum phase transitions in a high-*T_c* superconductor*. **PNAS** 119, 40 (2022). DOI: 10.1073/pnas.2207766119. 34 citations, 17c/y, IF:10.8
6. J. Alcalà, M. Roig, S. Martín, A. Barrera, A. Fernández-Rodríguez, A. Pomar, L. Balcells, M. Coll, N. Mestres, A. Palau (CA) (10/10). *Potential of Copper Oxide High-Temperature Superconductors*

- for Tailoring Ferromagnetic Spin Textures. Book Chapter In: *Surfaces and Interfaces of Metal Oxide Thin films, Multilayers, Nanoparticles and Nanocomposites*. Springer, Cham. 167-182 (2021) https://doi.org/10.1007/978-3-030-74073-3_7
7. S. Marinkovic, A. Fernandez-Rodriguez, S. Colliene, S. Blanco Alvarez, S. Melinte, B. Maiorov, G. Rius, X. Granados, N. Mestres, A. Palau (CA), A.V. Silhanek (AC) (10/11). *Direct visualization of current-stimulated oxygen migration in YBCO thin films*. **ACS Nano** 14, 11765 (2020). DOI: 10.1021/acsnano.0c04492. 16 citations, 4c/y, IF: 16.2
 8. V. Rouco, C. Navau, N. Del-Valle, D. Massarotti, G. P. Papari, D. Stornaiuolo, X. Obradors, T. Puig, F. Tafuri, A. Sanchez, A. Palau (CA) (11/11). *Depairing Current at High Magnetic Fields in Vortex-Free High-Temperature*. **Nano Letters**, 19, 4174 (2019). DOI: 10.1021/acs.nanolett.9b01693. 11 citations, 2.2c/y, IF: 10.2
 9. A. Palau (CA), S. Valencia, N. Del-Valle, C. Navau, M. Cialone, A. Arora, F. Kronast, D.A. Tennant, X. Obradors, A. Sanchez, T. Puig (1/11). *Encoding Magnetic States in Monopole-Like Configurations Using Superconducting Dots*. **Advanced Science**, 3, 1600207 (2016). DOI: 10.1002/advs.201600207. 12 citations, 1.5c/y IF: 16.3
 10. A. Palau (CA), H. Parvaneh, N. Stelmashenko, H. Wang, J. Macmanus-Driscoll, M.G. Blamire (1/6). *Hysteretic vortex pinning in superconductor-ferromagnet nanocomposites*. **Physical Review Letters** 98, 117003 (2007). DOI: 10.1103/PhysRevLett.98.117003. 44 citations, 2.6c/y IF: 9.3

C.2. International Meetings - Selección of 10 Invited Contributions

1. Magnetic Metasurfaces for sustainable Information and Communication Technologies, A. Palau, E. Fourneau, N. Bort-Soldevila, J. Cunill-Subiranas, N. Mestres, Ll. Balcells, N. Del-Valle, V. Uhler, S. Bending, C. Navau, A. V. Silhanek. **154th TMS Annual Meeting & Exhibition (TMS2025)**. Las Vegas (USA). 24/03/2025- 27/03/2025
2. *Heterostructures and hybrid systems based on HTS for energy-efficient ICT*. A. Palau, E. Fourneau, N. Bort-Soldevila, J. Cunill-Subiranas, N. Mestres, Ll. Balcells, N. Del-Valle, V. Uhler, S. Bending, C. Navau, A. V. Silhanek. **9th International Conference on Superconductivity and Magnetism (ICSM2024-ICQMT2024)**. Fethiye (Turquia). 27/04/2024 – 04/05/2024
3. *Nanoengineered High-Temperature Superconductors for Efficient Functional Devices*. A. Palau, J. Alcalà, A. Barrera, A. Fernández-Rodríguez, T. Günkel, Ll. Balcells, N. Mestres, E. Fourneau, A.V. Silhanek. **II Latin American Conference on Superconductivity and Magnetism**. Peru (Lima). 23/10/23 – 27/10/23 (Plenary)
4. *Nano-engineered high-temperature and hybrid systems for energy-efficient functional devices*. A. Palau, J. Alcalà, A. Barrera, A. Fernández-Rodríguez, T. Günkel, Ll. Balcells, N. Mestres, A. Sanchez, S. Marinkovic, E. Fourneau, A.V. Silhanek. **XXXVIII Reunión Bienal de la RSEF. Murcia (Spain)**. 11/07/2022 – 15/07/2022
5. *Nano-engineered high-temperature superconductors for functional quantum devices*. A. Palau, A. Barrera, A. Fernández-Rodríguez, J. Alcalà, Ll. Balcells, N. Mestres. **IEEE Nano 2022 – Nanofabrication for Quantum Technologies. Palma de Mallorca (Spain)**. 04/07/2022 – 08/07/2022
6. *Tuning of the Superconductor-Insulator Transition by Field-Induced Oxygen Migration*. A. Palau, A. Fernández-Rodríguez, S. Marinkovic, J. Alcalà, S. Colliene, X. Granados, N. Mestres, A.V. Silhanek. **20th International Union of Material Research Societies – IUMRS-ICA. Perth (Australia)**. 22/09/2019 – 26-09/2019.
7. *Challenges and opportunities for nanoengineered high temperature superconducting films with novel functionalities*. A. Palau, A. Fernández-Rodríguez, J. Alcalà, X. Granados, X. Obradors, T. Puig, N. Mestres. **14th European Conference on Applied Superconductivity, EUCAS 2019, Glasgow (Scotland)**. 01/09/2019 – 05/09/2019
8. *New Functionalities for energy-efficient superconducting electronic devices*, A. Palau, A. Fernández-Rodríguez, J. Alcalà, X. Granados, X. Obradors, T. Puig, N. Mestres. **Vortex 19. Antwerp (Belgium)**. 20/05/2019 – 25/05/2019
9. *Volume Resistive Switching in metallic perovskite oxides driven by the Metal- Insulator Transition*. A. Palau, J.C. Gonzalez-Rosillo, M. Coll, X. Obradors, T. Puig, J. Suñé, R. Dittmann, I. Maggio-Appriele. **ECS Meeting. National Harbor, MD (USA)**. 01/10/2017 - 05/10/2017
10. *New strategies for engineering pinning landscapes in CSD YBCO nanocomposites*. A. Palau, V. Rouco, N. Mestres, T. Puig, X. Obradors. **2016 MRS Spring Meeting. Phoenix, Arizona (USA)**. 28/03/2016 – 01/04/2016

C.3. Research projects

1. **High-temperature superconductors and hybrid systems for functional devices (HTSUPERFUN).** PID2021-124680OB-I00. Funded by: Ministry of Science and Innovation – AEI. “Knowledge Generation Projects”. PI: A. Palau. (ICMAB-CSIC) 01/09/2022 – 01/09/2025 - 193.600€. Participation: Principal Investigator
2. **Magnetic Metasurfaces for sustainable Information and Communication Technologies (MetaMagIC).** PCI2021-122028-2A. Funded by: CHIST-ERA Call 2020: AEI - Horizon 2020 FET program through the ERA-NET Cofund. PI: A. Palau (ICMAB-CSIC). 01/01/2022- 01/01/2025 – 1.006.802€ (Total Project). 206.319€ (ICMAB). Participation: PI and project coordinator
3. **Multiferroic nanocomposites for the energy harvesting of light and magnetic fields (MAGNETOLIGHT).** TED2021-130402B-I00. Funded. Ministry of Science and Innovation – AEI. IP: M. Coll / A. Palau. (ICMAB) 01/11/2022 – 01/11/2025 – 178.250 €. Participation: Principal Investigator
4. **Hybrid Superconductor-Ferromagnetic Metamaterials for functional devices with efficient control of magnetic field (METAMAG).** CEX2019-000917-S-FYP-8. Funded by: Severo Ochoa FUNFUTURE_FIP. Frontier Interdisciplinary Projects (FIP), IP: A. Palau. 01/09/2021-01/09/2023 – 70.000€. Participation: Principal Investigator
5. **Spanish Nanolithography Network (NANOLITO).** RED2022-134096-T. Funded by - Ministry of Science and Innovation, AEI. Coordinator: José Maria de Teresa. 06/2023–06/2025 -15,000 €. Participation: Principal Investigator (ICMAB group)
6. **Superconducting Nanodevices and Quantum Materials for Coherent Manipulation (SUPERQUMAP).** CA21144 COST Action. Funded: EU COST actions, IP: H. Sudorow. 01/09/2022 - 01/09/2025 - 500,000 €. Participation: Member of the Management Committee.
7. **Reversible Switching of Superconductor Insulator Transition for Green Electronic Devices (SUPERSWITCH).** FUNMAT-FIP-2018. Funded by: Severo Ochoa FUNFUTURE_FIP. Frontier Interdisciplinary Projects (FIP), IP: A. Palau. (ICMAB) 01/12/2018 - 31/12/2019 - 59,982€. Participation: Principal Investigator

C.4. Contracts, technological or transfer merits

3 patents licensed to spin-off OXOLUTIA on HTS tape preparation (2007, 2009, 2012)

C.5. Training activity

Director of 11 PhD theses (5 in progress and 6 completed). All now have Post-Doc or Scientific Technician positions in National or International centres (see application form), 10 Master's (1 in progress), and 21 Final Degree projects (1 in progress). Professor in the Master program – Advanced Nanoscience and Nanotechnology, Official Master Program, UAB (2015 - Present)

C.6. Pre- and post-doctoral stays.

- Pre-Doc – Total period: 3 months (ZFG, Gottingen, Germany, Oak Ridge National Lab, USA)
- Post-Doc – Total period: 2 years (2005-2007) (University of Cambridge, UK)

C.7. Organization of R&D activities. Membership of International Committees / Consortiums

- Member of the Organizing Committee: Symposium - IMRC-ICAM 2022, 2022, Cancun, Mexico; MATENER2018- School on Materials for Energy, 2018, Barcelona, Spain; School on Quantum Materials 2018, Braga, Portugal; Symposium - IUMRS-ICAM2017, August 2017, Kyoto University, Japan; International Conference on Coated Conductor Applications, CCA2009, Barcelona, Spain
- Member of the Royal Spanish Physical Society, European Society on Applied Superconductivity, Materials Research Society, European Physical Society, American Physical Society
- Member of the Management Committee of the COST-ACTION CA21144 (SUPERQUMAP) network
- Member of the editorial board: Scientific Reports (Springer Nature), Superconducting Science and Technology (IOP science), Frontiers in Physics.
- Member of the FWO Flanders (Belgium) – W&T3 Condensed Matter Project Panel – 2020 – Present