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ACADEMIC APPOINTMENTS AND EDUCATION

Research Professor	ICMAB-CSIC (2018 -
Research Scientist	ICMAB-CSIC (2009-2017)
Tenured Scientist	ICMAB-CSIC (1999-2009)
Post-doctoral Fellow	ICMAB-CSIC (1998-1999)
Post-doctoral Fellow	Université de Picardie Jules Verne – CNRS (1996-97)
Ph.D. in Materials Science (with honors)	Universitat Autònoma de Barcelona, June 1995
Master in Materials Science	Universitat Autònoma de Barcelona, June 1993
B.S in Chemistry (with honors)	Universitat Autònoma de Barcelona, June 1991

RESEARCH INTERESTS AND ACHIEVEMENTS

Research involving solid state chemistry and electrochemistry applied to battery technology covering already commercial technologies (e.g. Ni or Li-ion) or pre-commercial (Na-ion) technologies as well as new battery chemistries and emerging concepts (Mg or Ca based). Emphasis is set in developing new materials tailoring structure and microstructure to maximise electrochemical performance and understanding redox mechanisms though investigation of electrode and electrolyte reactivity. Focus on developing fertile cooperation scenarios between basic oriented research and industry. Main scientific achievements include:

- Understanding the structural transformations taking place in the positive electrode of *nickel based batteries* through operando neutron diffraction and correlation between defects present in the crystal structure and electrochemical performance.
- Research in new alternative materials for *lithium ion batteries*, achievement of high temperature operation for $LiFePO_4$, and investigation of electrodes reacting via a new non intercalation based mechanism.
- Pioneering recent technological development for *Na-ion batteries* through optimizing electrolyte formulation and negative electrode performance.
- Demonstration of the viability of calcium metal as anode material, first step towards proof-of-concept of a new high-energy *battery technology based on calcium*.

SCIENTIFIC ACTIVITY

Research production and impact

Published > 130 manuscripts in peer reviewer journals, referenced over 8000 times, h-index of 37 (Web of Science). Co-author of 7 book chapters, co-inventor in 9 patents (6 of them jointly owned by CSIC and Toyota Motor Europe). Advisor of 8 PhD and >15 MS students.

Grants and projects

PI of diverse National grants involving battery materials research activity, joint bilateral international projects with RSC (UK) and CNRS (France) and H2020 research projects: NAIADES (Na-ion batteries, coordinated by CEA (France) 2015-2018), e-Magic (FET-PROACTIVE, Mg batteries, coordinated by Cidetec (Spain) 2019-2022) and coordinator of H2020 FET-OPEN CARBAT (Ca batteries, 2017-2020). PI of industrially funded projects: Repsol (2012-2019), Toyota Motor Europe (2013-2017), Ficosa and Premo (2009-2011) and Air Products (2006-2008).

Governing and advisory boards

- Scientific co-director of the ALISTORE-ERI European virtual research institute devoted to battery research enlisting 23 academic institutions and 12 industrial club members (2008-2017).
- Deputy Director at ICMAB-CSIC since 2014.
- Vice-president for International Battery Association since March 2018. Member of Governing Board since 2012.
- Member of the Executive Committee for the International Meeting on Lithium Batteries (IMLB) Limited Liability Company since 2014.
- Member of CEA International Scientific Advisory Board (France), 2015.
- Member of CAM-IES International Scientific Assessment Panel (Cambridge, UK), since 2017.
- International research project evaluation panels (France, Sweden, Quebec, Netherlands).
- Member of the Karlsruhe Institut of Technology (KIT) Advisory Board on “Electrochemical Energy Storage” since 2019.

Editorial Boards

- Associate editor for Chemistry of Materials (ACS, since 2016).
- Scientific Reports (Nature Publishing Group 2012-2016).
- Materials for Renewable and Sustainable Energy (Springer, 2012-2016).
- Journal of Power Sources (Elsevier, 2009-2016).

Professional Organizations

- Nominated to AcademiaNet (www.academia-net.org) by CSIC in 2020.
- Member of the Electrochemical Society since 1996.
- *VI Premi Sant Albert per a Llicenciats en Ciències Químiques* (1991) and *IX Premi Sant Albert a la Investigació Química* (1994) awards by the Col.legi Oficial de Químics de Catalunya.
- *Premio Joven Investigador en Materiales* by the Sociedad Española de Materiales (1999).
- Member of the Real Sociedad Española de Química and Societat Catalana de Química since 2004.

PUBLICATION HIGHLIGHTS

- *Understanding ageing in Li-ion batteries: a chemical issue*; M.R. Palacín. Chem. Soc. Rev. 2018, 47, 4924-33.
- *Why do batteries fail?* A. de Guibert, M.R. Palacín. Science, 2016, 351(6273) 1253292.
- *Towards a calcium-based rechargeable battery*; A. Ponrouch, C. Frontera, F. Barde, M.R. Palacin. Nat. Mater. 2016, 15, 169-173.
- *Recent achievements on inorganic electrode materials for lithium ion batteries*. L. Croguennec, M.R. Palacín. J. Am. Chem. Soc. 2015, 237, 3140-3156
- *Towards high energy density sodium ion batteries through electrolyte optimization.* A.Ponrouch, R. Dedryvere, D. Monti, A.E. Demet, J.M. Ateba Mba, L. Croguennec, C. Masquelier, P. Johansson, M R. Palacín. Energy & Environmental Science 2013, 6, 2361-9.
- *A new room temperature and solvent free carbon coating procedure for battery electrode materials*. A. Ponrouch, A.R. Goñi, M.T. Sougrati, M. Ati, J.M. Tarascon, J. Nava-Avendaño, M.R. Palacín. Energy & Environmental Science 2013, 6, 3363-71.
- *Deciphering the structural transformation during nickel oxyhydroxide electrode operation.* M. Casas- Cabanas, J. Canales-Vázquez, J. Rodríguez-Carvajal, M.R. Palacín. J. Am. Chem. Soc. 2007, 129, 5840-2.

RECENT KEYNOTE AND INVITED TALKS

- 2019 International Battery Seminar & Exhibit, US, March 2019 *"Li-ion battery aging: lessons learnt on the way to the future"*
- 2019 ACS Spring Meeting ACS Spring Meeting, US, April 2019 *"Developing calcium batteries: The good, the bad, and the ugly"*
- International Symposium on the Reactivity of Solids ISRS-19, Germany, July 2018

"On the quest for cathode materials in multivalent battery technologies"

- IMLB 2018, 19th International Meeting on Lithium Batteries, Japan, June 2018

"On the quest for Ca battery cathodes: the beauty and the beast"

- INTERNATIONAL BATTERY ASSOCIATION MEETING- IBA2018, Korea, March 2018.

"On the quest for cathode materials for calcium batteries"

- 2018 Batteries Gordon Research Conference, US, March 2018 *"The long and winding road towards Ca batteries"*

SCIENCE AND PUBLIC OUTREACH

- Public Entities: Co-author of Basic Research Needs for Electrical Energy Storage, US DoE (April 2007) and the Roadmapping Exercise on Materials for the European Strategic Energy Technology Plan in Energy Storage, EC (December 2010-February 2011). Participation in the LIVE project for Electric Vehicle implementation in Barcelona (Barcelona City Council 2009).
- Scientific Events: Co-organizer of National meetings (QIES, STN) and diverse International battery related symposia held both in Europe and US (ECS, MRS IUCr, IMLB, IBA etc).
- Teaching and Education: Teaching battery technology within the Postgraduate in Electric Vehicles and Other Propulsion Technologies. Polytechnic University of Catalonia (UPC) since 2011. Participation in National and International Summer Schools and Workshops such as UCM El Escorial, UIMP, Barcelona Summer Tech, or Chalmers Battery Initiative.
- Social Outreach Activities: round tables and conferences (STA, ETSE, Automobile Barcelona, Foro Innovación, Fòrum Àgora, Expominer, Barcelona Smartmoto Challenge amongst others) and press, radio or TV media events and interviews (TVE2, Canal 33, RAC1, Onda Cero, El Pais). Participation in ICMAB-CSIC activities aiming at bringing science to high school students and raising awareness about achievements of women scientists through history.