

Andreu Cabot

ICREA Research Professor
 Catalonia Institute for Energy Research – IREC
 08930, Sant Adrià de Besòs, Barcelona, Spain
 Tel. +34 625615115
 Email: acabot@irec.cat

RESEARCH INTERESTS

- Synthesis, surface chemistry and application of nanostructured materials
- Use of nanomaterials for energy conversion and storage technologies: including thermoelectricity, metal/sulfur and metal/air batteries, electrocatalytic power-to-fuel-to-power technologies.

EDUCATION and TRAINING

2004-2007 University of California at Berkeley and Lawrence Berkeley National Laboratory
 Postdoctoral Fellow in Prof. A. Paul Alivisatos Group

1999-2003 Universitat de Barcelona
 PhD in Physics. Advisor: Prof. Joan Ramon Morante

1998 Universitat de Barcelona
 Physics Degree

PREVIOUS SCIENTIFIC AND PROFESSIONAL ACTIVITIES

1. Teacher/research assistant	Universitat de Barcelona	04/2003 - 02/2004
2. Postdoctoral researcher	University of California at Berkeley, USA	03/2004 - 03/2006
3. Postdoctoral researcher	Lawrence Berkeley National Laboratory, USA	03/2006 - 09/2007
4. Ramon y Cajal researcher	Universitat de Barcelona	12/2007 - 12/2012
5. Lecturer	Universitat de Barcelona	12/2012 - 09/2013

MAIN RECENT PUBLICATIONS (2017-2021)

Overall Numbers: Over 200 publications in international journals; Over 1700 citations/year; h-index=57; i10-index=144; 5 patents; <https://scholar.google.com/citations?user=OoS8ca0AAAAJ&hl=en>

Selected Recent Publications

- Z. Liang et al. *Atomically dispersed Fe in a C₂N Based Catalyst as a Sulfur Host for Efficient Lithium-Sulfur Batteries*, **Advanced Energy Materials** 2021, 11, 2003507.
- D. Yang et al. *NbSe₂ Meets C₂N: A 2D-2D Heterostructure Catalysts as Multifunctional Polysulfide Mediator in Ultra-Long-Life Lithium-Sulfur Batteries*, **Advanced Energy Materials** 2021, 11, 2101250
- Y. Zhang et al. *Doping-mediated stabilization of copper vacancies to promote thermoelectric properties of Cu_{2-x}S*, **Nano Energy** 2021, 85, 105991.
- C. Zhang et al. *Tubular CoFeP@CN as a Mott-Schottky Catalyst with Multiple Adsorption Sites for Robust Lithium-Sulfur Batteries*, **Advanced Energy Materials** 2021, 11, 2100432.
- B. Fei et al. *Hierarchical Nanoreactor with Multiple Adsorption and Catalytic Sites for Robust Lithium-Sulfur Batteries*, **ACS Nano** 2021, 15, 6849.
- M. Li et al. *Effect of the Annealing Atmosphere on Crystal Phase and Thermoelectric Properties of Copper Sulfide*, **ACS Nano** 2021, 15, 4967.
- S. Yuan et al. *Chromium-Based Metal-Organic Framework as A-Site Cation in CsPbI₂Br Perovskite Solar Cells*, **Advanced Functional Materials** 2021, 2106233.
- Z. Liang et al. *Molecular Engineering to Tune the Ligand Environment of Atomically Dispersed Nickel for Efficient Alcohol Electrochemical Oxidation*, **Advanced Functional Materials** 2021, 2106349.
- Zhang, Y et al. *Influence of copper telluride nanodomains on the transport properties of n-type bismuth telluride*, **Chemical Engineering Journal** 2021, 418, 129374
- Li, J et al. *Nickel Iron Diselenide for Highly Efficient and Selective Electrocatalytic Conversion of Methanol to Formate*, **Small** 2021, 2006623.
- Liu, K et al. *Architecturing 1D-2D-3D Multidimensional Coupled CsPbI₂Br Perovskites toward Highly Effective and Stable Solar Cells*, **Small** 2021, 17, 2100888
- D. Yang et al., *ZnSe/N-Doped Carbon Nanoreactor with Multiple Adsorption Sites for Stable Lithium-Sulfur Batteries*, **ACS Nano** 2020, 14, 15492.
- X. Yu et al. *Phosphorous incorporation in Pd₂Sn alloys for electrocatalytic ethanol oxidation*, **Nano Energy** 2020, 77, 105116.

- J. Li et al. *Selective Methanol-to-Formate Electrocatalytic Conversion on Branched Nickel Carbide*, **Angewandte Chemie-international Edition** 2020, 59, 20826.
- Y. Zuo et al., *A SnS₂ Molecular Precursor for Conformal Nanostructured Coatings*, **Chem. Mater.** 2020, 32, 2097.
- I. Liashenko et al. *Ultrafast 3D printing with submicrometer features using electrostatic jet deflection*, **Nature Comm.** 2020, 11, 753.
- X. Yu et al. *Self-Induced Strain in 2D Chalcogenide Nanocrystals with Enhanced Photoelectrochemical Responsivity*, **Chem. Mater.** 2020, 32, 2774-2781.
- Y. Zuo et al. *A SnS₂ Molecular Precursor for Conformal Nanostructured Coatings*, **Chem. Mater.** 2020, 32, 2097.
- X. Yu et al. *Stability of Pd₃Pb Nanocubes during Electrocatalytic Ethanol Oxidation*, **Chem. Mater.** 2020, 32, 2044.
- F. Urbain et al. *Upscaling high activity oxygen evolution catalysts based on CoFe₂O₄ nanoparticles supported on nickel foam for power-to-gas electrochemical conversion with energy efficiencies above 80%*, **Appl. Catal. B: Environ.** 2019, 259, 118055.
- Y. Zuo et al. *In Situ Electrochemical Oxidation of Cu₂S into CuO Nanowires as a Durable and Efficient Electrocatalyst for Oxygen Evolution Reaction*, **Chem. Mater.** 2019, 31, 7732-7743.
- J. Liu et al. *Chromium phosphide CrP as highly active and stable electrocatalysts for oxygen electroreduction in alkaline media*, **Appl. Catal. B: Environ.** 2019, 256, 117846.
- C. Zhang et al. *Combined High Catalytic Activity and Efficient Polar Tubular Nanostructure in Urchin-Like Metallic NiCo₂Se₄ for High-Performance Li-S Batteries*, **Adv. Funct. Mater.** 2019, 29, 1903842.
- M. Ibañez et al. *Tuning Transport Properties in Thermoelectric Nanocomposites through Inorganic Ligands and Heterostructured Building Blocks*, **ACS Nano** 2019, 13, 6572-6580.
- M. Ibañez et al. *Ligand-Mediated Band Engineering in Bottom-Up Assembled SnTe Nanocomposites for Thermoelectric Energy Conversion*, **J. Am. Chem. Soc.** 2019, 141, 8025-8029.
- J. Liu et al. *Graphene-supported palladium phosphide PdP₂ nanocrystals for ethanol electrooxidation*, **Appl. Catal. B: Environ.** 2019, 242, 258-266.
- Y. Zahng et al. *Tin Diselenide Molecular Precursor for Solution-Processable Thermoelectric Materials*, **Angew. Chem.** 2018, 130, 17309-17314.
- A. Morata et al. *Large-area and adaptable electrospun silicon-based thermoelectric nanomaterials with high energy conversion efficiencies*, **Nature Comm.** 2018, 9, 4759.
- J. Li et al. *NiSn bimetallic nanoparticles as stable electrocatalysts for methanol oxidation reaction*, **Appl. Catal. B: Environ.** 2018, 234, 10-18.
- Y. Liu et al. *Crystallographically Textured Nanomaterials Produced from the Liquid Phase Sintering of Bi_xSb_{2-x}Te₃ Nanocrystal Building Blocks*, **Nano Lett.** 2018, 18, 2557-2563.
- Y. Liu et al. *High Thermoelectric Performance in Crystallographically Textured n type Bi₂Te_{3-x}Sex Produced from Asymmetric Colloidal Nanocrystals*, **ACS Nano** 2018, 12, 7174-7184.
- J. Liu et al. *Triphenyl Phosphite as the Phosphorus Source for the Scalable and Cost-Effective Production of Transition Metal Phosphides*, **Chem. Mater.** 2018, 30, 1799-1807.
- J. Liu et al. *SnP nanocrystals as anode materials for Na-ion batteries*, **J. Mater. Chem. A** 2018, 6, 10958.
- M. Ibañez et al. *Tuning p-Type Transport in Bottom-Up-Engineered Nanocrystalline Pb Chalcogenides Using Alkali Metal Chalcogenides as Capping Ligands*, **Chem. Mater.** 2017, 29, 7093.
- C. Coughlan et al. *Compound copper chalcogenide nanocrystals*, **Chem. Rev.** 2017, 117, 5865.
- S. Ortega et al. *Bottom-up engineering of thermoelectric nanomaterials and devices from solution-processed nanoparticle building blocks*, **Chem. Soc. Rev.** 2017, 46, 3510.
- Doris Cadavid, Andreu Cabot, *Oxidation at the Atomic Scale*, **Science**, 2017, 356, 245.
- T. Berestok et al., *Tuning Branching in Ceria Nanocrystals*, **Chem. Mater.** 2017, 29, 4418.

RECENT PATENTS

- Inventors: I. Liashenko, J. Rosell, A. Cabot, *Printing device and method*; EU; Filed: May 2019
- Inventors: I. Liashenko, J. Rosell, A. Cabot, *Method for determining the speed of printing of fiber and the length of printed fiber*; EU; Filed: May 2019

MAIN ONGOING PROJECTS

- Combining energy sources to enhance catalytic processes in the energy area, COMBENERGY, PID2019-105490RB-C32, Spanish MINECO, 2020-2022
- Solid-liquid thermoelectric systems with uncorrelated properties, UncorrelaTEd, H2020-FETOPEN-2019, 863222, European Commission, 2020-2024
- Energy harvesting via wetting/drying cycles with nanoporous electrodes, EHAWEDRY, H2020-FETOPEN-2020, 964524, European Commission, 2021-2024
- Toward sustainable batteries based on silicon, sulfur and biomass-derived carbon, 2BoSS, ERA-NET Confund on Raw Materials (ERA-MIN), 2022-2024