

Bio Sketch

Enrique del Barco

Associate Dean / College of Science Building • Box 162385, Orlando, FL 32816-2385

Phone: 407-823-1912 • e-mail: delbarco@ucf.edu

Group web-site: www.delbarcolab.com

(a) PROFESSIONAL PREPARATION

Univ. of Barcelona	Spain	Condensed Matter Physics	B.S., 1996
Univ. of Barcelona	Spain	Condensed Matter Physics	Ph.D., 2001

(b) PROFESSIONAL APPOINTMENTS

University of Central Florida	Pegasus Professor of Physics	2022 – present
University of Central Florida	Associate Dean of Sciences	2018 – present
University of Central Florida	Interim Assoc. Dean of Sciences	2017 – 2018
University of Central Florida	Associate Chair of Physics	2016 - 2018
University of Central Florida	Professor	2015 - 2022
University of Central Florida	Associate Professor	2009 - 2015
University of Central Florida	Assistant Professor	2004 - 2009
New York University	Postdoctoral Associate	2002 – 2004

(c) PUBLICATIONS

Five more current publications:

1) Gyan Khatri, Gregory Fritjofson, Jacob Hanson-Flores, Jaesuk Kwon, Enrique Del Barco. A 220GHz-1.1THz continuous frequency and polarization tunable quasi-optical electron paramagnetic resonance spectroscopic system. *Rev. Sci. Instrum.* **94**, 034714 (2023) <https://doi.org/10.1063/5.0107237>

2) Yulong Wang, Qian Zhang, Hippolyte P.A.G. Astier, Cameron Nickle, Saurabh Soni, Fuad A. Alami, Alessandro Borrini, Ziyu Zhang, Christian Honnigfort, Björn Braunschweig, Andrea Leoncini, Dong-Cheng Qi, Yingmei Han, Enrique del Barco, Damien Thompson, and Christian A. Nijhuis. Dynamic Molecular Switches with Hysteretic Negative Differential Conductance Emulating Synaptic Behaviour. *Nature Materials* **21**, 1403–1411 (2022) <https://doi.org/10.1038/s41563-022-01402-2> / Work highlighted in the News & Views of the journal by Joshua Hihath “Molecular electronics go synaptic” *Nat. Materials News & Views*, *Nature Materials*, **21**, 1346–1347 (2022)

3) Christian A. Nijhuis, Ziyu Zhang, Francis Adoah, Cameron Nickle, Senthil Kumar Karuppanan, Lejia Wang, Li Jiang, Anton Tadich, Bruce Cowie, Teddy Salim, Dong-Chen Qi, Damien Thompson, and Enrique Del Barco. Control over Molecular Orbital Gating and Marcus Inverted Charge Transport in Molecular Junctions with Conjugated Molecular Wires. *Advanced Electronic Materials*, 2200637 (2022)

4) Archit Dhingra, Xuedong Hu, Mario F. Borunda, Joe F. Johnson, Christian Binek, Jonathan Bird, Alpha T. N'Diaye, Jean-Pascal Sutter, Emilie Delahaye, Eric D. Switzer, Enrique del Barco, Talat S. Rahman, and Peter A. Dowben. Perspective: Molecular Transistors as Substitutes for Quantum Information Applications. *J. Phys.: Cond. Matt.* **34**, 441501 (2022)

5) Ran Liu, Yingmei Han, Feng Sun, Gyan Khatri, Jaesuk Kwon, Cameron Nickle, Lejia Wang, Chuan-Kui Wang, Damien Thompson, Zong-Liang Li, Christian A. Nijhuis, and Enrique del Barco. Stable Universal 1- and 2-Input Single-Molecule Logic Gates. *Advanced Materials* **34**, 2202135 (2022)

Five other publications:

6) Yingmei Han, Cameron Nickle, Maria Serena Maglione, Senthil Kumar Karuppannan, Javier Casado-Montenegro, Dongchen Qi, Xiaoping Chen, Anton Tadich, Bruce Cowie, Marta Mas-Torrent, Concepció Rovira, Jérôme Cornil, Jaume Veciana, Enrique del Barco, and Christian A. Nijhuis. "Bias-Polarity Dependent Direct and Inverted Marcus Charge Transport Affecting Rectification in a Redox-Active Molecular Junction". *Advance Science*, 210055 (2021)

7) Yingmei Han, Cameron Nickle, Ziyu Zhang, Hippolyte P. A. G. Astier, Thorin J. Duffin, Dongchen Qi, Zhe Wang, Enrique del Barco, Damien Thompson and Christian A. Nijhuis. "Electric-field-driven dual-functional molecular switches in tunnel junctions". *Nature Materials* **19**, 843–848 (2020)

8) Priyanka Vaidya, Sophie A. Morley, Johan van Tol, Yan Liu, Ran Cheng, Arne Brataas, David Lederman, and Enrique del Barco. "Subterahertz spin pumping from an insulating antiferromagnet". *Science* **368**, 160-165 (2020) / *Work highlighted in the Journal by a perspective article: Spin pumping gathers speed, by Axel Hoffman, Science 368, 135-136 (2020)*

9) L. Yuan, L. Wang, A. R. Garrigues, L. Jiang, H. V. Annadata, M. Anguera Antonana, E. del Barco, and C. A. Nijhuis. "Transition from Direct to Inverted Charge Transport Marcus Regions in Molecular Junctions via Molecular Orbital Gating". *Nature Nanotech.* **13**, 322–329 (2018) / *Work highlighted in the News & Views of the journal by Joshua Hihath "Charge transport in the inverted Marcus region" Nat. Nanotechnology News & Views.*

10) X. Chen, M. Roemer, L. Yuan, W. Du, D. Thompson, **E. del Barco**, and C. A. Nijhuis. "Large-Area Molecular Tunnel Junctions with Giant Rectification of Electrical Current". *Nature Nanotechnology* **12**, 797-803 (2017) doi:10.1038/nnano.2017.110 (2017) *Highlighted in the Journal News&Views (Nicolas Clement and Akira Fujiwara "Molecular diodes: Breaking the Landauer limit")*

(d) GRADUATE STUDENTS MENTORED

- Cameron Nickle, Ph.D. Fall 2020 / Priyanka Vayda, Ph.D, Fall 2019 / Rebecca Cebulka, Ph.D, Spring 2019 / Marta Anguera, Ph.D, Fall 2018 / Alvar Rodriguez, Ph.D, Spring 2016
- 12 Ph.D, 3 master and 2 honors in the major students have graduated from my group.

(e) RELEVANT SYNERGISTIC ACTIVITIES

1. Referee of multiple journals, agencies and institutions
2. Co-chair and host of the 2012 *International Conference of Molecular Magnetism*, October 7-11, Orlando-FL.
3. Member of the *Program Committees* for several international conferences in magnetism.
4. Co-organizer of the annual workshop series "Quantum Coherent Properties of Spins I (New Orleans, Dec-2008), II (Vancouver, CA Dec-2009) and III (Orlando, Dec-2010).
5. Member of the NHMFL-EMR Users Committee since 2010.