

Gerardo Morell

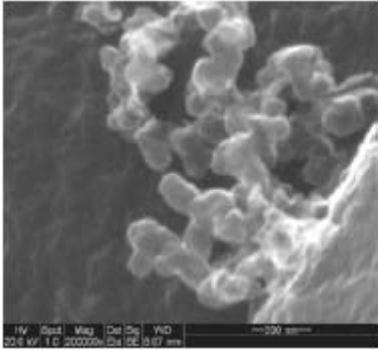
Nanoscientist

University of Puerto Rico, Río Piedras Campus

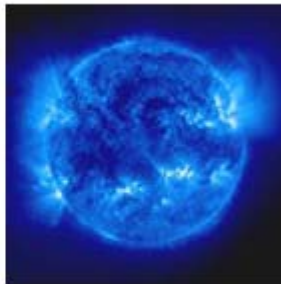
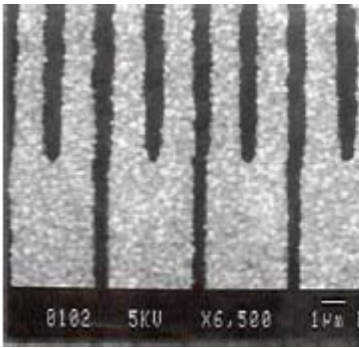


Biography

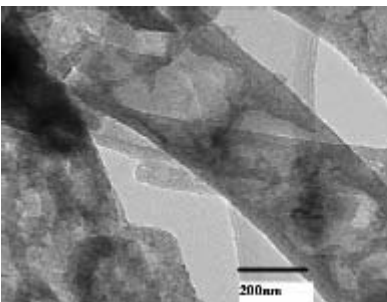
Born in Arecibo, Puerto Rico, Morell obtained a doctoral degree in Chemical Physics from the [University of Puerto Rico, Río Piedras Campus](#) (UPRRP) in 1995. Morell is a competitive researcher and faculty member in the [Department of Physics](#) of UPRRP, where he develops Nanoscience and Technology projects sponsored by [NASA](#), the [Department of Energy](#), the [Department of Defense](#), and the [National Science Foundation](#). These projects involve local and external collaborators, and graduate and undergraduate students of Physics, Chemistry and Chemical Physics. Morell's research team develops new knowledge and innovative concepts for the fabrication of costeffective, rugged, and brighter flat panel displays based on nanostructured materials synthesized at the [University of Puerto Rico](#). They also work on the optimization of rechargeable lithium batteries by employing nanocrystalline electrodes that improve their charge capacity and extend their lifetime. These projects are moving into the testbed phase through the Institute for Functional Nanomaterials and its strategic partners at the [NASA Glenn Research Center](#) and the [Center for Hierarchical Manufacturing](#) at the [University of Massachusetts Amherst](#). Morell is also securing the intellectual property of these projects through patent applications to the [United States Patent and Trademark Office](#) that have strong commercialization potential.



Diamond nanoparticles developed for electronic applications.



Diamond UV sensor for UV astronomy applications.



Bamboo-like carbon nanotubes developed for enhanced rechargeable lithium batteries.

Teams

[Cluster I: Functional Dispersed Nanostructures](#), [Cluster II: Functional Nanostructures at the Interface](#), [Cluster III: Multifunctional Nanostructures](#)

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Education

- Ph.D. in Chemical Physics, [University of Puerto Rico, Río Piedras Campus](#) (1995)
- M.Sc. in Physics, University of Puerto Rico, Rio Piedras Campus (1994)
- B.Sc. in Physics, University of Puerto Rico, Rio Piedras campus (1989)

Appointments

2006– present Director & Professor, Department of Physics, University of Puerto Rico, Rio Piedras Campus, San Juan, PR, United States
2004– present Director, Puerto Rico NASA Space Grant Consortium, UPR Resource Center for Science and Engineering, San Juan, PR, United States
2004– present Director, Puerto Rico NASA EPSCoR, UPR Resource Center for Science and Engineering, San Juan, PR, United States
2004– 2006 Professor, Department of Physical Sciences, University of Puerto Rico, Rio Piedras Campus, San Juan, PR, United States
1999– 2004 Associate Professor, Department of Physical Sciences, University of Puerto Rico, Rio Piedras Campus, San Juan, PR, United States
1995– 1999 Assistant Professor, Department of Physical Sciences, University of Puerto Rico, Rio Piedras Campus, San Juan, PR, United States

Publications

1. P. X. Feng, L. F. Fonseca, V. I. Makarov, G. Morell, B. R. Weiner, and H. Zhang, "Growth and field emission properties of one-dimensional carbon composite structure consisting of vertically aligned carbon nanotubes and nanocones", *Journal of Physics D: Applied Physics*, 42, 035409 (2009)
2. C. R. Cabrera, I. Gonzalez-Gonzalez, G. Morell, D. A. Tryk, and B. R. Weiner, "Modulation of electron transfer activity at diamond films by dissolved oxygen in aqueous solution", *Journal of the Electrochemical Society*, (2009)
3. L. F. Fonseca, G. Morell, F. Piazza, O. Resto, and F. Sola, "Synthesis of diamond nanocrystals on polyimide film", *Diamond and Related Materials*, 18, 113 (2009)

4. P. X. Feng, V. I. Makarov, G. Morell, B. R. Weiner, and H. Zhang, "Synthesis of nanostructured SiC using the pulsed laser deposition technique", *Materials Research Bulletin*, 44, 184 (2009)
5. G. Morell and F. Piazza, "Wettability of hydrogenated tetrahedral amorphous carbon", *Diamond and Related Materials*, 18, 43 (2009)
6. J. De Jesus, A. González-Berriós, S. Katar, G. Morell, and B. R. Weiner, "Direct Deposition of Bamboo-Like Carbon Nanotubes on Copper Substrates by Sulfur-Assisted HFCVD", *Journal of Nanomaterials*, 2008, 515890 (2008)
7. A. Biaggi-Labiosa, J. De Jesus, L. F. Fonseca, A. Gonzalez-Berrios, G. Morell, O. Resto, and F. Sola, "Nanocrystalline silicon as the light emitting material of a field emission display device", *Nanotechnology*, 19, 225202 (2008)
8. A. Biaggi-Labiosa, J. De Jesus, L. F. Fonseca, A. Gonzalez-Berrios, G. Morell, O. Resto, and F. Sola, "Porous silicon for field emission display applications", *Physica Status Solidi*, 5, 3479 (2008)
9. G. Morell, K. Uppireddi, and B. R. Weiner, "Study of the temporal current stability of field-emitted electrons from ultrananocrystalline diamond films", *Journal of Applied Physics*, 103, 104315 (2008)
10. G. Morell, C. Ortiz, W. Otaño, V. M. Pantojas, A. Rivera, D. Rodríguez-Vindas, and J. J. Santiago-Avilés, "Synthesis of palladium with different nanoscale structures by sputtering deposition onto fiber templates", *Journal of Nanophotonics*, 2, 021925 (2008)

Grants

1. O. Auciello, C. R. Cabrera, M. J. Guinel, Y. Ishikawa, J. Jelinek, M. Jose-Yacamán, G. Morell, R. G. Raptis, and G. Sandi. FUNDAMENTAL SCIENCE OF NANOSTRUCTURED ELECTROCATALYSTS/ DIAMOND SUPPORTS FOR FUEL CELL APPLICATIONS, United States Department of Energy, Hydrogen, 3 years, October 2009, Single PI, Pending, \$3,900,000.
2. A. J. Hernández, Y. Ishikawa, B. Luna, G. Morell, and R. G. Raptis. A Combined Experimental and Theoretical Approach for the Development of Selective Nanoporous Gas Sorbents for the Effective Restoration of Breathing Air in Crewed Space Craft, National Aeronautics and Space Administration, EPSCoR, 3 years, October 2009, Multiple PIs, Pending, \$1,350,000.
3. J. China, J. Goodman, R. Green, L. Guild, S. Hunt, J. Lekki, V. Manian, E. Middleton, G. Morell, S. Van Bloem, and M. Velez-Reyes. Hyperspectral imaging for biodiversity assessment of coastal and terrestrial ecosystems, National Aeronautics and Space Administration, EPSCoR, 3 years, October 2009, Multiple PIs, Pending, \$1,350,000.
4. L. F. Fonseca, M. A. Hines, R. D. Kirby, A. R. Mayol, G. Morell, L. G. Rosa, N. Sepúlveda, E. Y. Tsymbal, and J. Velev. University of Puerto Rico System PREM in Materials Research to Achieve Competitiveness and Promote Diversity in World-Class NSE, National Science Foundation, Partnerships for Research and Education in Materials , 5 years, September 2009, Multiple PIs, Pending, \$3,500,000.

5. C. R. Cabrera, L. F. Fonseca, R. Furlan, G. Morell, L. G. Rosa, N. Sepúlveda, and J. Vedrine. MRI: Acquisition of an Atomic Force Microscope Nanolithography DPN 5000 System, National Science Foundation, DMR - MRI, 1 year, August 2009, Multiple PIs, Pending, \$386,736.
6. G. Morell. Curricular Enhancements in Health Physics at the University of Puerto Rico, Other, Nuclear Regulatory Commission - Education, 3 years, August 2009, Single PI, Pending, \$349,813.
7. V. I. Makarov, G. Morell, and B. R. Weiner. Mechanistic Study of Sulfur-Assisted HFCVD of Diamond Films, National Science Foundation, CHEM, 3 years, August 2009, Multiple PIs, Pending, \$636,592.
8. M. J. Guinel, S. Katar, G. Morell, and B. R. Weiner. Research and Education on High Performance Energy Storage Materials, United States Department of Defense, HBCU-MI, 3 years, August 2009, Multiple PIs, Pending, \$445,394.
9. M. Gómez, A. R. Mayol, E. Melendez-Ackerman, G. Morell, and L. Velazquez. From Hectares to Nanometers: GK-12 Multidisciplinary Explorations of Tropical Ecosystems and Functional Nanoscience, National Science Foundation, EHR, 5 years, May 2009, Multiple PIs, Approved, \$2,600,000.
10. F. M. Aliev, C. R. Cabrera, L. F. Fonseca, K. H. Griebenow, A. J. Hernández, Y. Ishikawa, R. S. Katiyar, M. M. Martínez, A. R. Mayol, G. Morell, W. Otaño, R. G. Raptis, and B. R. Weiner. Center for Advanced Nanoscale Materials (CANM) NASA University Research, National Aeronautics and Space Administration, URC, 5 years, October 2008, Multiple PIs, Approved, \$6,000,000.
11. O. Auciello, S. Bader, D. Bonnell, S. Desu, L. F. Fonseca, M. Gómez, S. Hong, Y. Ishikawa, R. S. Katiyar, V. Makarov, A. R. Mayol, G. Morell, W. Otaño, R. Palai, O. J. Perales, A. Petford-Long, R. Ramesh, A. Rastogi, R. Thomas, and M. S. Tomar. Development and Understanding of Multifunctional Nanostructures for Spintronics and Magnetoelectrics Applications, United States Department of Energy, EPSCoR, 3 years, September 2008, Multiple PIs, Approved, \$2,245,000.
12. C. R. Cabrera, Y. Ishikawa, R. S. Katiyar, G. Morell, and R. G. Raptis. Space Exploration Enabling Power Systems: Partnership to Develop the Fundamental Science at UPR and Perform the Corresponding Proof-of-Concept at NASA GRC, National Aeronautics and Space Administration, EPSCoR, 3 years, October 2007, Multiple PIs, Approved, \$1,350,000.
13. G. Morell and B. R. Weiner. Developing Research Expertise in Support of Space Exploration, National Aeronautics and Space Administration, EPSCoR, 3 years, October 2007, Multiple PIs, Approved, \$425,000.
14. P. X. Feng and G. Morell. Design and manufacturing large area, thick cBN films for high power energy device applications, National Science Foundation, DMR, 3 years, July 2007, Multiple PIs, Approved, \$208,000.
15. P. X. Feng, Y. Ishikawa, G. Morell, and B. R. Weiner. Large area, ambient pressure synthesis of nanocomposite carbon films, United States Department of Defense, AFSOR, 3 years, October 2006, Multiple PIs, Approved, \$500,000.
16. G. Morell and B. R. Weiner. Puerto Rico NASA Space Grant Consortium, National Aeronautics and Space Administration, Space Grant, 5 years, April 2005, Multiple PIs, Approved, \$2,700,000.