

Irene Calizo

Citizenship : USA • Website : <http://quest.fiu.edu/icalizo>

Contact

office : (305) 348-3703

e-mail : irene.calizo@fiu.edu

Institution:

Department of Electrical & Computer Engineering
Florida International University
10555 W. Flagler St. EC 3952
Miami, FL 33174

Education

Ph.D. in Electrical Engineering

University of California Riverside, Riverside, CA, USA

M.S. in Electrical Engineering

San Jose State University, San Jose, CA, USA

B. of Electrical Engineering

Georgia Institute of Technology, Atlanta, GA, USA

B.S. in Physics, minor Mathematics, cum laude

Spelman College, Atlanta, GA, USA

Research Interests

- ✓ 2D nanomaterials and devices, Raman and surface enhanced Raman spectroscopy; electrical, optical, and thermal properties of graphene and carbon materials and devices; electrical and optoelectronic devices; photodetectors and photovoltaics; carbon electronics; graphene/metal interactions, nanostructures and devices; role of disorder and strain in nanomaterials and devices; Raman imaging studies of nanoscale material and device;

Teaching and Advising

- ✓ Introduction to Nanoelectronic Materials Fall 2012
- ✓ Introduction to Nanomaterials/Electronic Properties of Materials Spring 2013
- ✓ Current Thesis Advisor: Ingrid Torres (Ph.D.), Md. Monirojjaman Monshi (Ph.D.), Komal Chawla (Ph.D.)
- ✓ Dissertation Committee Member for Ange Fievre, Mustafa Karabiyik, and Abhay Vasudev
- ✓ Research Advisor: Kristopher Rosado (B.S.)
- ✓ Research Experiences for Teachers Advisor: Carmen Garcia (Coral Park High School), Ricardo Markland (Coral Park High School), Michael Windisch (Rockway Middle School)

Employment History

Electrical & Computer Engineering Dept., Florida International University
Miami, FL

Asst. Professor
Aug 2012 - present

- ✓ Director of Quantum Electronic Structures Technology (QuEST) Laboratory
- ✓ Joint appointment with Mechanical and Materials Engineering Dept.

National Institute of Standards and Technology
Gaithersburg, MD

Postdoc. Res. Assoc.
May 2009 to May 2012

- ✓ Developed a technique to etch graphene layers by metallic nanoparticles.
- ✓ Studied disorder in functionalized graphene by Raman spectroscopy to understand the role of defects in device performance.
- ✓ Developed gold sputtered substrates for surface-enhanced Raman spectroscopy to study pathogenicity of s. mutans and identify polymers produced by c. necator bacteria.

Publications

- ✓ R. Yan, Q. Zhang, W. Li, I. Calizo, T. Shen, C.A. Richter, A.R. Hight Walker, X. Liang, A. Seabaugh, D. Jena, H.G. Xing, D.J. Gundlach, and N.V. Nguyen, "Determination of graphene work function and graphene-insulator-semiconductor band alignment by internal photoemission spectroscopy," *Applied Physics Letters*, 101, 022105 (2012).
- ✓ X. Liang, B.A. Sperling, I. Calizo, G. Cheng, C.A. Hacker, Q. Zhang, Y. Obeng, K. Yan, H. Peng, Q. Li, X. Zhu, H. Yuan, A.R. Hight Walker, Z. Liu, L. Peng, and C.A. Richter, "Toward Clean and Crackless Transfer of Graphene," *ACS Nano*, 5, 9144 (2011).
- ✓ S. Gadipelli, I. Calizo, J. Ford, G. Cheng, A.R. Hight Walker, and T. Yildirim, "A highly practical route for large-area, single layer graphene from liquid carbon sources such as benzene and methanol," *Journal of Materials Chemistry*, 21, 16057 (2011).
- ✓ S. Jung, G.M. Rutter, N.N. Klimov, D.B. Newell, I. Calizo, A.R. Hight Walker, N.B. Zhitenev, and J.A. Stroscio, "Evolution of microscopic localization in graphene in a magnetic field from scattering resonances to quantum dots," *Nature Physics*, 7, 245, (2011).
- ✓ S. Ghosh, A.A. Balandin, D.L. Nika, E.P. Pokatilov, and I. Calizo, "Extraordinary Thermal Conductivity of Graphene: Prospects of Thermal Management Applications," *Proceedings of the International Heat Transfer Conference*, August 8-14, (2010).
- ✓ I. Calizo, I. Bejenari, M. Rahman, G. Liu, and A. A. Balandin, "Ultraviolet Raman microscopy of single and multilayer graphene," *Journal of Applied Physics*, 106, 043509 (2009). [24 citations]
- ✓ I. Calizo, S. Ghosh, F. Miao, W. Bao, C.N. Lau, and A. A. Balandin, "Raman nanometrology of graphene: Temperature and substrate effects," *Solid State Communications*, 149, 1132, (2009). [16 citations]
- ✓ M. Shamsa, S. Ghosh, I. Calizo, V. Ralchenko, A. Popovich, and A. A. Balandin, "Thermal conductivity of nitrogenated ultrananocrystalline diamond films on silicon," *Journal of Applied Physics*, 103, 083538 (2008). [16 citations]
- ✓ S. Ghosh, I. Calizo, D. Teweldebrhan, E. P. Pokatilov, D. L. Nika, a. A. Balandin, W. Bao, F. Miao, and C. N. Lau, "Extremely high thermal conductivity of graphene: Prospects for thermal management applications in nanoelectronic circuits," *Applied Physics Letters*, 92, 151911 (2008). [146 citations]
- ✓ A. A. Balandin, S. Ghosh, W. Bao, I. Calizo, D. Teweldebrhan, F. Miao, and C. N. Lau, "Superior thermal conductivity of single-layer graphene," *Nano Letters*, 8, 902 (2008). [670 citations]
- ✓ F. Parvizi, D. Teweldebrhan, S. Ghosh, I. Calizo, and A. A. Balandin, "Properties of graphene produced by the high pressure – high temperature growth process," *Micro & Nano Letters*, 3, 29 (2008). [19 citations]
- ✓ I. Calizo, W. Bao, F. Miao, C.N. Lau, and A.A. Balandin, "The effect of substrates on the Raman spectrum of graphene: graphene-on-sapphire and graphene-on-glass," *Applied Physics Letters*, 91, 201904 (2007). [38 citations]
- ✓ I. Calizo, A.A. Balandin, W. Bao, F. Miao, and C.N. Lau, "Temperature dependence of the Raman spectra of graphene and graphene multi-layers," *Nano Letters*, 7, 2645 (2007). [118 citations]
- ✓ I. Calizo, F. Miao, W. Bao, C.N. Lau, and A.A. Balandin, "Variable temperature Raman microscopy as a nanometrology tool for graphene layers and graphene-based devices," *Applied Physics Letters*, 91, 071913 (2007). [70 citations]
- ✓ W. L. Liu, M. Shamsa, I. Calizo, A. A. Balandin, V. Ralchenko, A. Popovich, and A. Saveliev, "Thermal conduction in nanocrystalline diamond films: Effects of the grain boundary scattering and nitrogen doping," *Applied Physics Letters*, 89, 171915 (2006). [21 citations]

Selected Talks

- ✓ I. Calizo, G. Cheng, and A.R. Hight Walker, "Etching of Graphene by Metallic Nanoparticles," Graphene Week 2011, Obergurgl Austria, April 26th, 2011.
- ✓ I. Calizo, I. Bejenari, M. Rahman, G. Liu, A.R. Hight Walker, A.A. Balandin, "Ultraviolet Raman Spectroscopy of Single and Multi-layer Graphene" Materials Research Society Spring Meeting, San Francisco, CA, 2010.
- ✓ I. Calizo, I. Bejenari, M. Rahman, G. Liu, A.A. Balandin, "Ultraviolet Raman Scattering in Graphene and Graphene Layers," New Diamond and Nano Carbons Conference, Traverse City, MI, 2009.
- ✓ I. Calizo, "Raman nanometrology of graphene," Electrical Engineering Dept. Colloquium - University of California Riverside, 2009.
- ✓ I. Calizo, "Raman nanometrology of graphene," National Institute of Standards and Technology, Gaithersburg, MD, 2009.
- ✓ I. Calizo, D. Teweldebrhan, S. Ghosh, F. Miao, W. Bao, C. N. Lau, and A. A. Balandin, "Nanometrology of graphene: effect of substrates and temperature," Electronic Materials Conference, University of California Santa Barbara, 2008.
- ✓ I. Calizo, S. Ghosh, F. Miao, W. Bao, C. N. Lau, and A. A. Balandin, "Raman nanometrology of graphene: temperature and substrate effect," ICTP Graphene Week Conference, Trieste, Italy, 2008.
- ✓ I. Calizo, S. Ghosh, F. Miao, W. Bao, C. N. Lau, and A. A. Balandin, "Temperature and interface effects on Raman spectrum of graphene layers on silicon, sapphire, gallium arsenide and glass substrates," Materials Research Society Spring Meeting, San Francisco, CA, 2008.
- ✓ I. Calizo, K. A. Alim, V. A. Fonoberov, S. Krishnakumar, M. Shamsa, A. A. Balandin, and R. Kurtz, "Micro-

Raman spectroscopic characterization of ZnO quantum dots, nanocrystals, and nanowires," Photonics West, San Jose, CA, 2007.

Honors, Grants, and Awards

- ✓ Florida Education Fund McKnight Junior Faculty Development Fellowship
- ✓ National Research Council Postdoctoral Fellowship 2009-2011
- ✓ UC Riverside Dr. Gordon S. and Anna Watkins Commencement Award 2009
- ✓ Electrical Engineering Department Outstanding Teaching Assistant 2008
- ✓ 2nd Place Award, Society of Women Engineers National Conf. Graduate Student Poster Competition 2007
- ✓ President, Electrical Engineering Graduate Student Association 2007-2008
- ✓ NASA Women in Science and Engineering Full Scholarship 1991-1996
- ✓ First Place Poster Award in Physics, Spelman College Science Day Competition 1994
- ✓ President, Spelman College Physics Club 1993-1994

Service

- ✓ Review Service to Professional Journals: Journal of Physical Chemistry, Journal of Raman Spectroscopy, IEEE Transactions on Nanotechnology, Journal of Materials Science, Micro & Nano Letters
- ✓ Panelist, NSF Grant Reviews
- ✓ Judge, FIU Materials Advantage Technical Oral Presentation Competition
- ✓ Judge, FIU Materials Advantage Technical Poster Presentation Competition
- ✓ Panelist, Engineering Session, Florida Education Fund McKnight Annual Fellows Meeting
- ✓ Member, ECE Faculty Search Committee
- ✓ Judge, South Florida Regional Science and Engineering Fair
- ✓ Invited Speaker, FIU Society of Women Engineers' Women in Engineering Luncheon
- ✓ Judge, FIU Graduate Student Scholarly Forum
- ✓ Certificate presenter at Spring 2013 Order of the Engineer Ceremony

Professional Memberships

- ✓ Institute of Electrical and Electronics Engineers (IEEE), American Physical Society (APS), International Society for Optical Engineering (SPIE), Materials Research Society (MRS), American Vacuum Society (AVS), Society of Women Engineers (SWE), Sigma Xi, Tau Beta Pi, Beta Kappa Chi