Juan Gabriel Ramírez Rojas

CURRICULUM VITAE

Cra 1 # 18A - 12, Department of Physics, Universidad de los Andes, Bogotá 111711, Colombia, +57 339-4949:3608, Mobile: +57 (311) 845-1978
jgramirez@uniandes.edu.co http://nanomag.uniandes.edu.co

Professional Preparation

Department of Physics, Universidad de Los Andes, **Colombia**, Associate Professor of physics, Nano-magnetism, and quantum materials.	2020 - Present
Department of Physics, Universidad de Los Andes, **Colombia**, Assistant Professor of physics, Nano-magnetism, and quantum materials.	2016 – 2019
Department of Physics, UC San Diego, **USA**, Postdoctoral Scholar in Multiple projects.	2011 – 2015
Department of Physics, Universidad de Los Andes, **Colombia**, Postdoctoral Scholar in Impedance spectroscopy of correlated oxide films.	2010 – 2011
Department of Physics, **Colombia**, Universidad del Valle, Doctor of Philosophy, Physics (Summa Cum Laude).	2009
Department of Physics, **Colombia**, Universidad del Valle, Bachelor of Science, Physics (Summa Cum Laude).	2004

Research and Professional Experience

Associate Professor, Department of physics, Universidad de los Andes. Investigation in strong electron-correlated materials and devices – **Quantum Materials** (nanoparticles, films, and bulk) with multiples degrees of freedom for applications to energy harvesting and resistive memories such as neuromorphic computing. — 2020 – Present

More information at http//nanomag.uniandes.edu.co

Visiting Professor & Research Scholar at UC San Diego, California USA. — 2022 – Present

Research in magnetization dynamics of complex oxide materials.

Assistant Professor, Department of physics, Universidad de los Andes. Investigation in strong electron-correlated materials and devices – **Quantum Materials**. — 2016 – 2020

Postdoctoral Scholar, University of California San Diego. i) Search for new superconductors via novel synthesis techniques, ii) Ferromagnetic resonance and Electron Spin Resonance in materials with magnetic phase transitions, iii) irradiation damage as a tool to control disorder in correlated systems — 2011 – 2015

Graduate Research Assistant, Universidad del Valle, Cali-Colombia. Systems with Metal-Insulator Transitions and phase coexistence studied at the nanoscale. Novel lithography techniques to achieve 30 nm resolution.	2004 – 2009
Graduate Research (internship), University of California San Diego, Physics Department. Advance lithography (optical and e-beam) techniques and deposition (reactive sputtering, e-beam evaporation, and MBE)	2003 – 2008
Undergraduate research, Universidad del Valle, Cali Colombia. Surface Fractal properties of correlated materials study by atomic force microscopy.	2002 – 2004

Honors and Awards

Ph.D. summa cum laude in Physics.	2009
Best Talk Nanocolombia Symposium.	2009
Ph.D. Colciencias Fellowship.	2005
B.A. summa cum laude in Physics.	2004

Professional Organizations

American Physical Society (APS, since 2003)

Material Research Society (MRS, since 2018)

Latinoamerican Magnetism Association. (ALMA, 2022)

Patents

1. Ivan K. Schuller, Jose de La Venta Granda, Siming Wang, **Juan Gabriel Ramirez**, Mikhail Erekhinskiy, Amos Sharoni. Magnetic and Electrical Control of Engineered Materials, PATENT: *US2015207060-A1 (2013).*
2. *Juan C. NINO, Juan G. RAMIREZ, Quantum Systems and Methods for Making and Using Thereof, U.S. Provisional Patent Application Serial No. 62/982,861, filed February 28, 2020.*

Research Publications *(h-index 19, 2022, Scopus)*

1. D. Carranza-Celis, E. Skoropata, Amlan Biswas, M.R. Fitzsimmons, Ivan K. Schuller and **Juan Gabriel Ramirez**, Magnetism dynamics driven by phase separation in Pr-doped manganite thin films: A Ferromagnetic resonance study, Physical Review Materials 5, 124413 (2021).
2. J. J. Prías-Barragán, a, R. González-Hernández, F. A. Hoyos-Ariza, **Juan Gabriel Ramírez**, M. R. Ibarra, P. Príeto, Magnetism in Graphene Oxide Nanoplatelets: The Role of Hydroxyl and Epoxy Bridges, J. Magn. Magn. Mater. 541, 168506 (2021).
3. Ilya Valmianski, Arantxa Fraile Rodríguez, Javier Rodríguez-Álvarez, Montse García del Muro, Christian Wolowiec1, Florian Kronast, **Juan Gabriel Ramírez**, Ivan K. Schuller,

Amílcar Labarta and Xavier Batlle, Driving magnetic domains at the nanoscale by interfacial strain-induced proximity, Nanoscale, **13**, 4985 (2021)

4. Heiddy P. Quiroz, E. F. Galíndez, A. Dussan, A. Cardona-Rodriguez, **Juan Gabriel Ramirez**, Super-Exchange Interaction Model in DMOs: Co-Doped TiO_2 Thin Films, J Mater Sci **56**, 581–591 (2021).
5. J. G. Monsalve, C. Ostos, E. Ramos, **Juan Gabriel Ramírez**, and O. Arnache, Insight into magnetic properties in zinc ferrite thin films by tuning oxygen content, Current Applied Physics **22** 77-83 (2021).
6. Jorge A. Calderón, F. Mesa, A. Dussan, R. González-Hernandez, **Juan Gabriel Ramirez**, The effect of Mn_2Sb_2 and Mn_2Sb secondary phases on magnetism in (GaMn)Sb thin films, PLoS ONE **15** (4): e0231538 (2020).
7. E. Ramos, A. Cardona-Rodriguéz, D. Carranza-Celis, R. Hernández-Rodriguéz, Diego Muraca, **Juan Gabriel Ramírez**, Strain-controlled ferromagnetism in $BiFeO_3$ Nanoparticles, J. Phys.: Condens. Matter **32** 185703 (2020).
8. Javier del Valle, Pavel Salev, Federico Tesler, Nicolás M. Vargas, Yoav Kalcheim, Paul Wang, Juan Trastoy, Min-Han Lee, George Kassabian, **Juan Gabriel Ramírez**, Marcelo J. Rozenberg & Ivan K. Schuller, Subthreshold firing in Mott nanodevices, Nature **569**, 388–392 (2019).
9. Diego Carranza-Celis, Alexander Cardona Rodríguez, Jackeline Narváez, Oscar Moscoso, Diego Muraca, Marcelo Knobel, Nancy Ornelas-Soto, Andreas Reiber, **Juan Gabriel Ramírez**, Control of Multiferroic properties in $BiFeO_3$ nanoparticles. Scientific Reports **9**, 3182 (2019).
10. Alexander Cardona, Isabel C. Arango, Maria F. Gomez, Claribel Dominguez, Juan Trastoy, Christian Urban, Soumitra Sulekar, Juan C. Nino, Ivan K. Schuller, Maria E. Gomez, and **Juan Gabriel Ramírez**, Resistive Switching in Multiferroic $BiFeO_3$ Films: Ferroelectricity vs vacancy migration. Solid State Communications **288** 38–42 (2019).
11. J. del Valle, **Juan Gabriel Ramírez**, M. Rosenberg, Ivan K. Schuller, Challenges in materials and devices for Resistive-Switching-based Neuromorphic Computing, J. Appl. Phys. **124**, 211101 (2018). Special Topic: New Physics and Materials for Neuromorphic Computation.
12. I. Valmianski, P. Y. Wang, S. Wang, **Juan Gabriel Ramirez**, S. Guénon, Ivan K. Schuller, The origin of the current-driven breakdown in vanadium oxides: thermal vs electronic, Phys. Rev. B **98**, 195144 (2018)
13. C. Orona-Návar Raul García-Morales, Rodrigo Rubio-Govea, Jürgen Mahlknecht, Raul Hernandez-Aranda, **Juan Gabriel Ramírez**, K.D.P. Nigam, Nancy Ornelas-Soto, Adsorptive removal of emerging pollutants from groundwater by using modified titanate nanotubes, J. Environ. Chem. Eng., **4**, 5332, (2018).
14. Non-equilibrium phase precursors to the insulator-metal transition in V_2O_3; Andrej Singer, **Juan Gabriel Ramirez**, Ilya Valmianski, Devin Cela, Nelson Hua, Roopali Kukreja, James Wingert, Olesya Kovalchuk, James M. Glownia, Marcin Sikiroski, Matthieu Chollet, Martin Holt, Ivan K. Schuller, and Oleg G. Shpyrko, Phys. Rev. Lett. **120**, 207601.
15. V. R. Singh, V. Jovic, I. Valmianski, **Juan Gabriel Ramirez**, B. Lamoureux, Ivan K. Schuller and K. E. Smith, Irreversible metal-insulator transition in thin-film VO_2 induced by soft X-ray irradiation, Appl. Phys. Lett. **111**, 241605 (2017).

16. Growth-Induced In-Plane Uniaxial Anisotropy in V_2O_3/Ni Films; Dustin A. Gilbert, **Juan Gabriel Ramirez**, T. Saerbeck, J. Trastoy, Ivan K. Schuller, Kai Liu, and J. de la Venta, Sci. Reports 7 13471 (2017).
17. Elsa Abreu, Stephanie N. Gilbert Corder, Sun Jin Yun, Siming Wang, **Juan Gabriel Ramirez**, Kevin West, Jingdi Zhang, Salinporn Kittiwatanakul, Ivan K. Schuller, Jiwei Lu, Stuart A. Wolf, Hyun-Tak Kim, Mengkun Liu, Richard D. Averitt, Ultrafast Electron-Lattice Coupling Dynamics in VO_2 and V_2O_3 Thin Films, Phys. Rev. B **96**, 094309 (2017).
18. Siming Wang, **Juan Gabriel Ramirez**, Jonathan Jeffet, Shimshon Bar-Ad, Dan Huppert, Ivan K. Schuller, Ultrafast photo-induced dynamics across the Metal-Insulator Transition of VO_2, EPL, **118**, 27005 (2017).
19. I. Valmianski, **Juan Gabriel Ramirez**, C. Urban, X. Batlle, and Ivan K. Schuller, Deviation from bulk in the pressure-temperature phase diagram of V_2O_3 thin films, Phys. Rev. B **95**, 155132 (2017).
20. **J. –G. Ramírez**, S. Wang, T. Saerbeck, S. Guenon, M. Goldflam, L. Anderegg, P. Kelly, Mueller, M. Liu, I. K. Schuller, D. N. Basov, Nano-texture through a canonical Mott transition; A. S. McLeod, E. van Heumen, Nat. Phys. **13**, 80 (2016).
21. S. Guenon, **J. –G. Ramírez**, A. C. Basaran, J. Wampler, M. Thiemens, and I. K. Schuller, Search for New Superconductors: An Electro-Magnetic Phase Transition in an Iron Meteorite Inclusion at 117 K, J. Supercond. Nov. Magn. 30, 297 (2016).
22. D. Yazici, A. C. Basaran, **J. –G. Ramírez**, I. K. Schuller, and M. B. Maple, Structure, magnetization, specific heat, and microwave properties of $K_xFe_{2-y}Se_2$, Supercond. Sci. Technol. **29**, 085015 (2016).
23. **J. –G. Ramírez**, J. de la venta, S. Wang, T. Saerbeck, A. C. Basaran, X. Batlle, and I. K. Schuller, Collective mode splitting in hybrid heterostructures, , Phys. Rev. B **93**, 214113 (2016).
24. Y. Tian, A. A. Reijnders, G. B. Osterhoudt, I. Valmianski, **J. –G. Ramírez**, C. Urban, R. Zhong, J. Schneeloch, G. Gu, I. Henslee, and K. S. Burch, Low vibration high numerical aperture automated variable temperature Raman microscope, Rev. Sci. Instrum. **87**, 043105 (2016).
25. Siming Wang, **Juan Gabriel Ramírez**, and Ivan K. Schuller, Avalanches in Vanadium Sesquioxide Nanodevices; Phys. Rev. B **92**, 085150 (2015).
26. E. Abreu, S. Wang, **Juan Gabriel Ramírez**, M. Liu, J. Zhang, I. K. Schuller, and R. D. Averitt, Dynamic conductivity scaling in photoexcited V_2O_3 thin films, Phys. Rev. B **92**, 085130 (2015).
27. **Juan Gabriel Ramírez**, Thomas Saerbeck, Siming Wang, J. Trastoy, M. Malnou, J. Lesueur, Jean-Paul Crocombette, Javier E. Villegas, and Ivan K. Schuller, Effect of disorder on the metal-insulator transition of vanadium oxides: local versus global effects, Phys. Rev. B **91**, 205123 (2015).
28. S. Guénon, **J. –G. Ramírez**, Ali C. Basaran, M. Thiemens, S. Taylor, and Ivan K. Schuller, Search for Superconductivity in Micrometeorites, Sci. Rep. **4**, 7333 (2014).
29. Thomas Saerbeck, Jose de la Venta, Siming Wang, **Juan Gabriel Ramírez**, Mikhail Erekhinsky, Ilya Valmianski, and Ivan K. Schuller, Invited Paper: Coupling of magnetism and structural phase transitions by interfacial strain, J. Mater. Res. **29**, 2353 (2014).

30. S. H. Dietze, M. J. Marsh, Siming Wang**, J. –G. Ramírez**, Z.-H. Cai, J. R. Mohanty, Ivan K. Schuller, X-ray induced persistent photoconductivity in vanadium dioxide, and O. G. Shpyrko, Phys. Rev. B **90**, 165109 (2014).
31. **J. –G. Ramírez**, Ali C. Basaran, J. de la Venta, Juan Pereiro, and Ivan K. Schuller, Magnetic Field Modulated Microwave Spectroscopy (MFMMS) across phase transitions and the search for new superconductors. Rep. Prog. Phys. **77** 093902 (2014).
32. J. de la Venta, Siming Wang, T. Saerbeck, **J. –G. Ramírez**, I. Valmiansky and Ivan K. Schuller. Coercivity Enhancement in V_2O_3/Ni Bilayers Driven by Nanoscale Phase Coexistence; Appl. Phys. Lett. **104**, 062410 (2014).
33. J. de la Venta, A. C. Basaran, T. Grant, J. M. Gallardo-Amores, **J. –G. Ramírez**, M. A. Alario-Franco, Z. Fisk, and I. K. Schuller, Magnetism and the absence of superconductivity in the praseodymium silicon system doped with carbon and boron, J. Magn. Magn. Mater. **340**, 27 (2013).
34. J. de la Venta, S. Wang, **J. –G. Ramírez** and I. K. Schuller Control of magnetism across metal to insulator transitions, Appl. Phys. Lett. **102** 122404 (2013).
35. S. Guénon, S. Scharinger, Siming Wang, **J. –G. Ramírez**, D. Koelle, R. Kleiner, and Ivan, K. Schuller, Electrical breakdown in a V_2O_3 device at the insulator-to-metal transition, EPL, **101** 57003 (2013).
36. **J. –G. Ramírez**, R. Schmidt, A. Sharoni, M. E. Gomez, I. K. Schuller, and E. J. Patiño, Ultra-Thin Filaments Revealed by the Dielectric Response Across the Metal-Insulator Transition in VO_2, Appl. Phys. Lett. **102**, (2013).
37. A. Zimmers, L. Aigouy, M. Mortier, A. Sharoni, S. Wang, K. G. West, **J. –G. Ramírez**, and I. K. Schuller Role of Thermal Heating on the Voltage Induced Insulator-Metal Transition in VO_2, Phys. Rev. Lett. **110**, 056601 (2013).
38. P. Prieto, L. Marín, S. M. Diez, **J. –G. Ramírez** and M. E. Gómez, Influence of Layer-Thickness Ratio on Magnetic Properties in F-$La_{2/3}Ca_{1/3}MnO_3$/AF-$La_{1/3}Ca_{2/3}MnO_3$ Bilayers, J Supercond Nov Magn. **25**, 2193 (2012)
39. M. K. Stewart, D. Brownstead, S. Wang, K. G. West, **J. –G. Ramírez**, M. M. Qazilbash, N. B. Perkins, I. K. Schuller, and D. N. Basov, Insulator-to-metal transition and correlated metallic state of V_2O_3 investigated by optical spectroscopy, Physical Review B **85**, 205113 (2012).
40. L. Marin, **J. –G. Ramírez**, M. E. Gómez, On the magnetic properties of F/AF Ca-doped lanthanum manganite bilayers: Approach to the interface effects, Journal of Physics: Conference Series **200** 072064 (2010).
41. **J. –G. Ramírez**, A. Sharoni, Y. Dubi, M. E. Gómez, and Ivan K. Schuller, First-order reversal curve measurements of the metal-insulator transition in VO_2: Signatures of persistent metallic domains, Phys. Rev. B **79**, 235110 (2009).
42. Amos Sharoni, **J. –G. Ramírez**, and Ivan K. Schuller, Multiple Avalanches across the Metal-Insulator Transition of Vanadium Oxide Nanoscaled Junctions, Phys. Rev. Lett. **101**, 026404 (2008).
43. M. E. Gómez, G. Campillo**, J. –G. Ramírez**, A. Hoffmann, and J. Guimpel, Detailed magnetic and structural properties of exchange-biased $La_{1-x}Ca_xMnO_3$;, phys. stat. sol. (c) 4, **11**, 4181–4187 (2007).

44. J. C. Caicedo, W. Saldarraiga, F. Pérez, **J. –G. Ramírez**, M. E. Gómez, P. Prieto, C. Cortés-Escobedo, Superconducting depression in thin films of $YBa_2Cu_3O_{7-\delta}$ based on the variation of the relative humidity and the time, Superficies y Vacío **20**(3),6-10 (2007).
45. M. E. Gómez, G. Campillo, **J. –G. Ramírez**, P. Prieto, A. Hoffmann, J. Guimpel, N. Haberkorn, A. Condo and F. Lovey, Magnetotransport properties in Epitaxial Exchance-Biased, $La_{2/3}Ca_{1/3}MnO_3La_{1/3}Ca_{2/3}MnO_3$ superlattices, IEEE Trans. Magn. 42, 2981 (2006).
46. L. Tirado-Mejía, **J. –G. Ramírez**, M. E. Gómez, H. Ariza-Calderón, Surface morphology analysis of GaInAsSb films grown by liquid phase epitaxy, Brazilian Journal of Physics, 36, 3B 1070 (2006).
47. **J. –G. Ramírez**, A. Cortes, W. Lopera, M. E. Gómez, and P. Prieto, Scaling laws in PZT thin films grown on Si(001) and Nb-doped $SrTiO_3$(001) substrates, Brazilian Journal of Physics, **36**, No. 3B 1066 (2006).
48. J. D. Uribe, J. Osorio, C. A. Barrero, D. Giratá, A. L. Morales, A. Devia, M. E. Gómez, **J. –G. Ramírez** and J. R. Gancedo, Hematite thin films: growth and characterization, Hyperfine Interact. **169**, 1355 (2006).
49. O. Morán, M. E. Gomez, **J. –G. Ramírez**, T. Schwarz, D. Fuchs, R. Hott, and R. Schneider, Structural and magnetic properties of epitaxial ferromagnetic-antiferromagnetic manganite multilayers, J. Appl. Phys. **97**, 10K116 (2005).
50. **J. –G. Ramírez**, F. Pérez, M. –E. Gómez and P. Prieto, Statistical study of AFM-images on Manganite thin films, phys. stat. sol. (c) **1**, No. s1-s4 (2004).

Ongoing Publications

1. C. Woloviek, A. Basaran, **Juan Gabriel Ramirez**, Ivan K. Schuller, Stress-tailoring the in-plane magnetic anisotropy of V_2O_3/Ni bilayers. In preparation.
2. Santiago Ceballos Medina, Lorena Marín, Alexander Cardona-Rodríguez, Mario Fernando Quiñonez-Penagos, and **Juan Gabriel Ramírez**, Resistive switching mechanisms in $BiFeO_3$ devices with YBCO and Ag as top electrodes. In preparation.
3. Alexander Cardona Rodríguez, Alex Hojem, Andreas Reiber, Ivan K. Schuller, Diego Muraca, **Juan Gabriel Ramírez**, Evidence of a glassy magnetic transition driven by structural disorder in $BiFeO_3$ nanoparticles, submitted.
4. James Wampler, Nelson Hua, Roopali Kukreja, **Juan Gabriel Ramirez**, Ali Basaran, Eric Fullerton, Oleg Shpyrko, Ivan K. Schuller, The Electromagnetic Origin of the Microwave Absorption Response of Fe_3O_4 Thin Films. In preparation.
5. Victor H. González, E. Ramos, R. González-Hernández, N.M. Vargas, S. Mercone, E.J. Patino, Ivan K. Schuller, and **J.G. Ramírez**, Electric and magnetic effects of long-range exchange coupling in Co/Nb/Co trilayers. In preparation.

Research Funding

European commission - REA	Novel magnetic nanostructures for medical applications – MAGNAMED #734801	01/01/22 – 31/12/24	EU$100k
Uniandes – G8 Antioquia	Desarrollo y evaluación in vitro de un prototipo de scaffold de matriz polimérica con adición de partículas magnéticas, funcionalizado con proteínas morfogenéticas BMP-2 producido por manufactura aditiva para regeneración ósea.	01/01/22 – 31/12/23	COL$45000k
Uniandes	Aumento de correlaciones electrónicas en materiales multifuncionales de óxidos de metales de transición mediante su nanoestructuración	01/01/21 – 31/12/22	COL$45000k
Uniandes - Monterrey	Nano-structured multifunctional materials: from NPs to composites for applications to thermoelectricity (PI, 50%)	09/1/17 – 09/1/19	$100.000
Colciencias	Structural characterization and elemental analysis of solids with multifunctional properties (PI, 100%)	08/1/17 – 08/1/18	$137.000
Uniandes	Control of multiferroic properties via quantum confinement (co-PI, 80%)	03/1/17 – 03/1/19	$35.000
Universidad del Valle	Materials and devices for neuromorphic computing (co-PI, 50%)	07/1/16 – 07/1/19	$20.000
Uniandes	Internal funding for setting up an ultrafast electronic setup for memory applications (PI, 100%)	06/1/16 – 06/1/17	$45.000
Colciencias	Multifunctional materials at extreme conditions: High magnetic fields and low temperatures (PI, 100%)	08/15/17 – 08/14/19	$70,000
Colciencias*	Magnetism Control at the nanoscale via proximity of multifunctional materials (PI, 100%)	08/15/17 – 08/14/19	$70,000

- Uniandes is short for Universidad de los Andes
- Colciencias (Now as MinCiencias) is the equivalent of NSF in Colombia
- Monterrey refers to Monterrey Technologic Institute, Monterrey, Mexico
- Values in USD unless otherwise.
- * This proposal was 4th overall (98/100) out of 200 proposals submitted to Colciencias. Only the first 20 got funded.

Recent Research Presentations

Invited	Juan Gabriel Ramírez, 1st Latin-American tutorial of magnetism - Modeling and simulations on magnetism, Virtual,	Micromagnetic simulations to explore nanoscale effects in complex materials: Phase separation and dynamics,	Nov. 8-19, 2021.
	Juan Gabriel Ramírez, Annual Conference on Magnetism and Magnetic Materials 2020 - Virtual Conference.	Unusual dynamical properties of oxide-magnetic heterostructures,	Nov. 2nd, 2020
	Juan Gabriel Ramírez, Universidad del Norte, Barranquilla, Colombia.	Confinement effects in quantum matter	January 23, 2020
	Juan Gabriel Ramirez. Condensed Matter Physics Seminar, Universidad de Chile, Virtual.	Unusual dynamical properties of oxide-magnetic heterostructures: Proximity effects	April 7, 2021.
	XXVII International Materials Research Congress, Cancun, Mexico	*Size-Induced Multiferroicity In Oxide Nanoparticles*	August 19, 2018
	1st Cali Magnetism School	*Research status of magnetism in Colombia*	February 26, 2018
	Physics Seminar at Universidad del Valle, Cali Colombia	*Ultrafast dynamics of first-order metal-insulator transitions*	October 18, 2017
	Colloquium at Universidad Distrital, Bogotá, Colombia	*Quantum correlations in solids*	September 8, 2017
	Physics Seminar at Department of Physics Bar Ilan University - Israel	*Pathways to control magnetization dynamics with first-order phase transitions*	December 20, 2016
	Physics Seminar at Physics department Universidad Autonoma de Madrid	*Controlling magnetization dynamics in heterostructures with first-order phase transitions*	December 16, 2016
	1st International Workshop on Superconductivity and Magnetism at Low Dimensionality, Bogotá	*Strongly correlated materials: Nanoscale Phase coexistence as a tool for magnetic control in hybrid materials*	December 5, 2016

	61st Annual Conference on Magnetism and Magnetic Materials. New Orleans,	*Controlling magnetization dynamics in hybrid heterostructures with first-order phase transitions*	October 31, 2016
Invited	3rd International Conference on Nanoscience, Nanotechnology, and Nanobiotechnology. University of Brasília Brazil	*Control of magnetization dynamics in hybrid materials at the nanoscale*	December 15, 2015
Contributor	International Conference on Magnetism, San Francisco, CA the USA	*Stress-induced Nanoscale Magnetic Domain Configurations Imprinted in Ni Thin Films by Proximity to V_2O_3*	July 15, 2018
	APS March Meeting 2018, 5-9 March, Los Angeles, CA USA.	*Volatile resistive memory and dynamics of VO_X nanodevices,*	March 5, 2018
	APS March Meeting 2018, 5-9 March, Los Angeles, CA USA.	*Multiferroic order in $BiFeO_3$ nanoparticles,*	March 5, 2018
	APS March Meeting 2018, 5-9 March, Los Angeles, CA USA.	*Size-effects in the ferroelectricity of $BaTiO_3$ single nanoparticles,*	March 5, 2018
	Colombian Physics Meeting, Cartagena, Colombia	*Conmutación resistiva y ferroeléctrica en películas delgadas de $BiFeO_3$*	October 3, 2017
	Colombian Physics Meeting, Cartagena, Colombia	*Síntesis y caracterización individual de la respuesta ferroelectrica en nanopartículas de $BiFeO_3$*	October 3, 2017
	62nd Annual Conference on Magnetism and Magnetic Materials, Pittsburgh	*Control of multiferroic order in $BiFeO_3$ nanoparticles*	November 6, 2016
	International French-US Laboratory on Nanoelectronics, San Diego, CA the USA	*Simple transition metal oxides*	November 4, 2016

APS March Meeting 2016, Baltimore, Maryland	*Collective Mode Splitting in Coupled Ferromagnet/Oxide Heterostructures*	March 17, 2016
APS March Meeting 2016, Baltimore, Maryland	*Voltage mediated metal to insulator transition in VO_2 and V_2O_3 nanodevices*	March 17, 2016
APS March Meeting 2016, Baltimore, Maryland	*Cryogenic Optical nano-imaging of phase coexistence in correlated oxides*	March 14, 2016
APS March Meeting 2016, Baltimore, Maryland	*Characterizing phase transitions in known materials with Magnetic Field Modulated Microwave Spectroscopy (MFMMS)*	March 14, 2016
APS March Meeting 2016, Baltimore, Maryland	*Search for New Superconductors: An Electro-Magnetic Phase Transition in an Iron Meteorite Inclusion at 117 K*	March 18, 2016

Research Mentoring

Ph.D. Students

- Alexander Cardona (2019 – projected graduation), Controlling multifunctional properties at the nanoscale in quantum materials.
- Diego Carranza (2020 – projected graduation), Magnetization dynamics in complex oxides nanostructures.

Masters Students

- Daniel Hernández, (2024 – projected graduation), novel magnetism in vanadium oxide nanostructures.
- Victor González (2019), Long-range coupling in magnetic metallic multilayers.
- Diego Andrés Carranza (2018), Control of Multiferroic order in $BiFeO_3$ Nanoparticles
- Andrés Jenaro López (2018), Nanoparticle trapping via dielectrophoresis for thermoelectric applications
- Oscar Garzón (2018 – projected graduation) Control of magnetic anisotropy via phase transitions Magneto Resistance effect
- Lorena Marín Mercado (2016, Co-Advisor) Interface effects on Ferro/Antiferro $La_{2/3}Ca_{1/3}MnO_3/La_{1/3}Ca_{2/3}MnO_3$ bilayers

Undergraduates Students

1. Sergio Andres Correal, First-principle calculations on the effect of vacancies on the optical and electronic properties of V_2O_5 nanoparticles (2021).

2. Daniel Alejandro Avila, Micromagnetic simulation of core-shell nanostructures with different morphology (2021).
3. Juan Camilo Giraldo (2020), Confinement effects on Rare-earth nickelate nano-particles: Magnetic and transport properties.
4. Omar Alejandro Zapata, "Quantum Confinement and Magnetic Properties of $SrRuO_3$ Nanoparticles", (2019)
5. María Fernanda Gómez (2018), Resistive switching in capacitor-like structures based on $BiFeO_3$.
6. Miguel Angel Roncancio Herrera (2018), proceso electroquímico para la síntesis de monocristales superconductores de $Ba_{1-X}K_XBiO_3$.
7. Carlos Buitrago Palomino (2018), Efectos de la estequiometria de oxigeno en las propiedades conductoras de monocristales de $Ba_{1-X}K_XBiO_3$.
8. Luis Rivera (2018), Susceptivilidad ac para la caracterización de materiales magnéticos y superconductores.
9. Juan Camilo López, (2018), Modelamiento y Simulación del Proceso de Síntesis de Nano-Partículas BaTiO3 por el Método de Hydrothermal.
10. María Catalina Herran González, (2017), Desarrollo de un prototipo de dielectroféresis para la separación de nanopartículas.
11. Carlos José Hernández Machado, (2017), Control magnético mediante transiciones de fase en bicapas V_2O_3/CoFeB.
12. Victor Hugo Gonzáles Sánchez, (2017), Estudio del acoplamiento RKKY en tricapas Co/Nb/Co utilizando magnetorresistencia.
13. Diego Luis Ramirez Milano, (2017), Medición de las propiedades eléctricas de películas delgadas de $BiFeO_3$ usando efecto Hall.

Research Assistants

- Diego Andrés Carranza, (Aug 2018 - present)

Postdoctoral Scientists

- Dr. Jackeline Narvaez Morales (Jan 2017 - present)

Visiting International Scholars

- Dr. Edwin Ramos (Jan 2020 - present)

Service

Departmental

Postgraduate Committee Coordinator	2021 – Present
Colloquium in Physics, Coordinator	2017 – 2018
Qualifying Exam Committee, Member	2017 – 2018
Teaching laboratories Coordinator	2017 – present
Research Laboratories Committee, member	2015 – present
Postgraduate Committee, Member	2016 – 2017
Graduate Student Quality Committee, Member	2017 – 2018

Undergraduate Committee, Member 2017 – present

Service to Research Community

- Proposal Reviewer Ministerio de Ciencia, Bogotá (2020 – Present)
- Proposal Reviewer Universidad Javeriana, Bogotá (2017 – Present)
- Reviewer- Physics Review Journals (PRB, PRL), 2011 – Present
- Reviewer- AIP Journals (AIP Advances, Journal of Applied Physics, Applied Physics Letters), 2011 – Present
- Session Chair- 62nd Annual Conference on Magnetism and Magnetic Materials, Pittsburgh, USA.
- Session Program Organizer- 63rd Annual Conference on Magnetism and Magnetic Materials, Pittsburgh, USA.
- Co-organizer, 1st International Workshop on Superconductivity and Magnetism at Low Dimensionality, Bogotá (2016)

Service to Broader Community

- Clubes de Ciencia (Science clubs). Superconductivity and low-temperature physics for everyone.
- Senecast, podcast: Starting April 2021 we host a monthly talk show program and interviewed up to now over 10 guests of diverse professions, spanning all areas of science and engineering. The focus is to disseminate the research projects developed by Universidad de Los Andes to a broader audience. Currently available at google podcast and Spotify. Source at https://www.spreaker.com/show/senecast

Education Contribution

Courses Taught

2015-02	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: 4.7 /5.0.	FISI1018
2016-01	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: 4.7 /5.0.	FISI1018
2016-01	*Advance laboratory*, Department of Physics. Semester: 1.5 hours per class, two classes per week, 29 weeks. Student evaluation: 4.5 /5.0.	FISI2051
2016-02	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week,	FISI1018

	29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: 4.7 /5.0.	
2016-02	*Advance laboratory*, Department of Physics. Semester: 1.5 hours per class, two classes per week, 29 weeks. Student evaluation: 4.5 /5.0.	FISI2051
2017-01	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: 4.7 /5.0.	FISI1018
2017-01	*Magnetism and Magnetic Materials*, Department of Physics. Semester: 1.5 hours per class, two classes per week, 29 weeks. Student evaluation: 4.5 /5.0. **(New in the curriculum)**	FISI3708
2017-02	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: 4.7 /5.0.	FISI1018
2017-02	*Magnetism and Magnetic Materials*, Department of Physics. Semester: 1.5hoursr per class, two classes per week, 29 weeks. Student evaluation: 4.5 /5.0. **(New in the curriculum)**	FISI3708
2018-01	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5hoursr per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: 4.7 /5.0.	FISI1018
2018-01	*Solid State Physics*, Department of Physics. Semester: 1.5 hours per class, two classes per week, 29 weeks. Student evaluation: 4.6/5.0	FISI3760
2018-02	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: 4.7 /5.0.	FISI1018
2018-02	*Solid State Physics*, Department of Physics. Semester: 1.5 hours per class, two classes per week, 29 weeks. Student evaluation: 4.6/5.0	FISI3760
2019-01	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: Above 4.6/5.0	FISI1018
	Graduate-level, Introduction to X-ray diffraction with Laboratory experiments. Semester: 1.5 hours per class, two classes per week, 29 weeks. Above 4.6/5.0.	FISI3760

2019-02	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: Above 4.6/5.0	FISI1018
	Graduate-level, Introduction to X-ray diffraction with Laboratory experiments. Semester: 1.5 hours per class, two classes per week, 29 weeks. Above 4.6/5.0.	FISI3760
2020-01	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1hoursour per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: Above 4.6/5.0.	FISI1018
	Waves and Fluids, Undergraduate. Semester: 1.5 hours per class, two classes per week, 29 weeks. Above 4.6/5.0.	FISI1038
2020-02	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester: 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: Above 4.6/5.0.	FISI1018
	Waves and Fluids, Undergraduate. Semester 1.5 hours per class, two classes per week, 29 weeks. Above 4.6/5.0.	FISI1038
2021-01	*Lecture*, Department of physics. Physics 101 (Equivalent) Mechanics, Semester 1.5 hours per class, two classes per week, 29 weeks. Book: Halliday, Resnick y Walker Vol. 1. Student evaluation: Above 4.6/5.0.	FISI1018
	Introduction to Physics. Semester 1.5 hours per class, two classes per week, 29 weeks. Book: Feynman Lectures, PSSC Physics book. Evaluation: Above 4.6/5.0.	FISI1038

Current Research Interests

Confinement effects of complex oxides for energy applications.

- Size-dependent properties of $BaTiO_3$ and $BiFeO_3$ Nanoparticles.
- Microfluidics and dielectrophoresis to engineer novel thermoelectric
- Advanced imaging techniques based on x-ray coherent diffraction imaging of single nanoparticles.

Novel magnetism effects induced by proximity to functional layered materials.

- Microwave absorption mechanism across phase transitions.
- Search for novel superconductors using Phase Spread Alloys.

Metal-Insulator Transition Materials for FET applications.

- Fabrication of VO_2-based Field Effect Transistor using advanced lithography techniques.

- Fabrication and transport characterization of complex oxides and highly correlated materials.

Research Collaborations

- **Nanoparticle structure and influence of size in the crystal structure of BFO High-Resolution Transmission electron microscopy**, Prof. Diego Muraca and Prof. Marcelo Knobel, Campinas, Brazil.
- **Ultrafast Optical Pump - XRD probe in Mott insulators.** In Collaboration with Prof. Oleg Shpyrko from the University of California, San, Diego and Prof. Andrej Singer at Cornell University. Measurements are done at SLAC Linac Coherent Light Source.

- **Detection of magnetism in single nano-particles via self-induction sensors.** Measurements will be done at Laboratorio de Nano-Magnetismo at Universidad de los Andes. Samples are prepared by Prof. Juan Claudio Nino at the University of Florida.

- **Ellipsometry and near-normal incidence reflectance measurements from far-infrared to ultraviolet frequencies of VO_2 and V_2O_3 thin films.** Measurements are carried out in collaboration with Professor Dimitri Basov at the University of California, San Diego.

- **20 nm spot-size X-ray scanning of sub-micron V_2O_3 devices.** Measurements are done in collaboration with Professor Oleg Shpyrko at the University of California, San Diego at the Advanced Photon Source in Argonne National Laboratory.

- **Optical pump - THz probe in V_2O_3 thin films**. Measurements are done in collaboration with Professor Richard Averitt at UC San Diego.

- **Small-Angle Neutron Scattering (SANS) and Polarized Neutron Reflectometry (PNR) in V_2O_3/Ni bilayers.** Measurements will be done in collaboration with Dr. Michael Fitzsimmons currently at Los Alamos National Laboratory.

- **Search for superconductivity in extraterrestrial materials (micrometeorites and lunar rocks).** In Collaboration with Mark Thiemens from the Department of Chemistry and Biochemistry at the University of California San Diego and Susan Taylor from Cold Regions Research and Engineering Laboratory.

Society Membership

American Physical Society (APS) - Regular Member	2004 – present
Materials Research Society (MRS) - Regular Member	2015 – present
Colombian Physical Society (SCF) - Regular Member	2004 – 2009