Michael Cabrera Baez, PhD

Curriculum Vitae

Email: mcabrerapk@gmail.com

https://www.webofscience.com/wos/author/record/891846

https://www.scopus.com/authid/detail.uri?authorId=55188506200

https://orcid.org/0000-0002-5113-1233

EDUCATION

- **PhD in Physics**, February 2014 - February 2017
  Thesis: Fundamental electronic and magnetic interactions in the cage compounds RT_2Zn_{20} (R = Y, Gd,Yb, T = Fe, Co).
  Scholarship: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)
  Universidade Federal do ABC, São Paulo, Brazil.
  [https://bdtd.ibict.br/vufind/Record/UFBC_3f0a10fecaa2ac894c1acc8c0da490ca**]**

- **MSc in Physics**, February 2012 - January 2014
  Thesis: Single crystal growth and characterization of the intermetallic systems YIn_3 and $FeGa_3$.
  Scholarship: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)
  Universidade Federal do ABC, São Paulo, Brazil.
  [https://bdtd.ibict.br/vufind/Record/UFBC_23d2ad0242409244210c5c881a2519f2]

- **B.S. in Physics**, August 2005 - December 2011
  Thesis: Structure and conductivity fluctuations of the $Y_3Ba_5Cu_8O_{18}$
  Scholarship: Fundación Bretano
  Universidad Nacional de Colombia, Bogotá, Colombia.

POSITIONS

- Assistant Professor (Permanent)
  February 2019 – Present
  Department of Physics
  Universidade Federal de Pernambuco, Brazil
  [https://www.ufpe.br/df/corpo-docente]

- Postdoctoral Fellow
  March. 2017 – January.2019
  Title of the project: Study of the physical properties of nanostructured materials and fundamental interactions in bulk systems.
  Scholarship: Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)
  Universidade Estadual de Campinas, Brazil.
  [https://bv.fapesp.br/en/bolsas/170838/study-of-the-physical-properties-of-nanostructured-materials-and-fundamental-interactions-in-bulk-sy/]

- Associated Researcher IFGW Thematic Project
  May 01, 2018 - April 30, 2023
  Title: Emergent phenomena in reduced dimension systems
  Grant number: 17/10581-1 FAPESP
  Universidade Estadual de Campinas, Brazil.
  [https://bv.fapesp.br/pt/auxilios/99997/fenomenos-emergentes-em-sistemas-de-dimensoes-reduzidas/]

AWARDS AND RECOGNITION

- Post-doc Fellowship FAPESP, 2017 – 2019.
- PhD; CAPES Scholarship, 2014 – 2017.
- Article selected as IOPselect [J. Phys.: Condens. Matter 26 (2014) 175501], Institute of Physics.
- Article listed as "Los 10 mejores artículos descargados de autores latinoamericanos en 2014" [J. Phys.: Condens. Matter 26 (2014) 175501], Institute of Physics.
- MSc; CAPES Scholarship, 2012 – 2014.

REFEREE OF INTERNATIONAL JOURNALS

- RSC Advances: an international journal to further the chemical sciences
- Current Nanoscience
- Journal of Materials Science: Materials in Electronics
- Physical Review Letters
- Journal of Physics-Condensed Matter
- Journal of Low Temperature Physics
- Journal of Physics D: Applied Physics
- Journal of Alloys and Compounds
- Modern Physics Letters B
- Open Chemistry
- Physical Review B

SCIENTIFIC PUBLICATIONS

1. CAMEJO, Y. M. ; GUIMARÃES, G. F. ; **CABRERA-BAEZ, M**. *Exploring temperature-dependent XRD and AC susceptibility of Eu1-xHoXCrO3 (x = 0.0, 0.5, and 1.0) system*. JOURNAL OF MATERIALS SCIENCE-MATERIALS IN ELECTRONICS, v. 35, p. 260, 2024. [https://doi.org/10.1007/s10854-023-11888-4]
2. **CABRERA-BAEZ, M**.; PADRÓN-HERNÁNDEZ, E. ; AVILA, M. A. ; RETTORI, C. *Evidence for Dyakonov-Perel spin relaxation in Gd^{3+}doped YFe_2Zn_{20}.* PHYSICAL REVIEW B, v. 107, p. 014401, 2023. [https://doi.org/10.1103/PhysRevB.107.014401]
3. **CABRERA-BAEZ, M**.; SILVA, K. V. R. A. ; RIBEIRO, P. R. T. ; RATKOVSKI, D. R. ; FRANÇA, E. L. T. ; FLESSA-SAVVIDOU, A. ; CASAS, B. ; SIEGRIST, T. ; BALICAS, L. ; REZENDE, S. M. ; MACHADO, F. L. A. *Giant magnetoresistance in the crystalline intermetallic compound YCd_6.* PHYSICAL REVIEW B, v. 107, p. 144414, 2023. [https://doi.org/10.1103/PhysRevB.107.144414]
4. GUERRA, Y. ; LEAL, L. ; **CABRERA-BAEZ, M.** ; PADRÓN-HERNÁNDEZ, E. ; CASTRO-LOPES, S. ; VIANA, BARTOLOMEU C. ; ABREU, G. ; CALAND, J. ; MATOS-RODRIGUES, P. ; SANTOS, F. ; MATILLA-ARIAS, J. ; PEÑA-GARCIA, R. *Cation distribution, Fe2+/Fe3+ valence states and oxygen vacancies detection in the Y2.98Er0.02Fe5−yCryO12 compound*. JOURNAL OF ALLOYS AND COMPOUNDS, v. 960, p. 170607, 2023. [https://doi.org/10.1016/j.jallcom.2023.170607]
5. SOARES, A.S. ; CASTRO-LOPES, S. ; **CABRERA-BAEZ, M**. ; MILANI, R. ; PADRÓN-HERNÁNDEZ, E. ; FARIAS, B.V. ; SOARES, JOÃO M. ; GUSMÃO, SUZIETE S. ; VIANA, BARTOLOMEU C. ; GUERRA, Y. ; OLIVEIRA, CARLA S. ; PEÑA-GARCIA, R. **.** *The role of pH on the vibrational, optical and electronic properties of the Zn Fe O compound synthesized via sol gel method***. Solid State Sciences,** v. 128, p. 106880, 2022. [https://doi.org/10.1016/j.solidstatesciences.2022.106880]
6. **CABRERA-BAEZ, M**.; PADRÓN-HERNÁNDEZ, E.; SOARES, JOÃO M.; SANTOS, F.E.P.; GUERRA, Y.; PEÑA-GARCIA, R.; *Effect of Yttrium substitution in Fe-doped ZnO nanoparticles: An EPR study*. **Journal of Magnetism and Magnetic Materials**, v. 538, p. 168317, 2021. [https://doi.org/10.1016/j.jmmm.2021.168317]
7. PEÑA-GARCIA, R.; GUERRA, Y.; CAMEJO, Y. M.; SOARES, J. M.; FRANCO JR, A.; PADRÓN-HERNÁNDEZ, E.; **CABRERA-BAEZ, M.**; *Morphological, magnetic and EPR studies of ZnO nanostructures doped and co-doped with Ni and Sr*. **Ceramics International**, v. 47, p. 28714-28722, 2021. [https://doi.org/10.1016/j.ceramint.2021.07.030]
8. CAMEJO, J. M.; FRANÇA, E. L. T.; MARIN-RAMIREZ, J. M.; **CABRERA-BAEZ, M**.: *Correlation between structure and magnetic properties in $Eu_{1-x}Ho_xCrO_3$ (x = 0.0, 0.5 and 1.0) orthochromites.* **J Mater Sci: Mater Electron** 32:12283–12291 (2021). [https://doi.org/10.1007/s10854-021-05857-y]
9. FAHL, A.; GROSSI, R.; RIGITANO D.; **CABRERA-BAEZ, M**., AVILA, M. A.; ADRIANO, C.; GRANADO, E.; *Crystal, local atomic and electronic structures of $YbFe_2Zn_{20-x}Cd_x$ (0 < x < 1.4): a multi-band system with possible coexistence of light and heavy fermions*. **Physical Review B**, v. 103, p. 155116, 2021. [https://doi.org/10.1103/PhysRevB.103.155116]
10. **CABRERA-BAEZ, M**.; MUNEVAR, J.; COUTO-MOTA, R. M.; CAMEJO, Y. M.; CONTRERAS, C.; BAGGIO-SAITOVITCH, E.; AVILA, M. A.; RETTORI, C.: *Unconventional enhancement of ferromagnetic interactions in Cd-doped single crystals studied by ESR and Mössbauer spectroscopies.* **Physical Review B**, v. 102, p. 144420, 2020. [https://doi.org/10.1103/PhysRevB.102.144420]
11. DE QUEIROZ, THIAGO B.; **CABRERA-BAEZ, MICHAEL**; MENEGASSO, PAULO; MARTINEZ, EDUARDO D. ; GARCÍA FLORES, ALI F. ; RETTORI, CARLOS ; URBANO, RICARDO R. . *Probing Surface Effects on α-$NaYF_4$ Nanoparticles by Nuclear Magnetic Resonance*. **Journal of Physical Chemistry C**, v. 124, p. 9523, 2020. [https://doi.org/10.1021/acs.jpcc.0c00776]
12. CALAND, J.P. ; MEDRANO, CYNTHIA P.C. ; CAYTUERO, A. ; BAGGIO-SAITOVITCH, E. ; LITTERST, F.J. ; SOARES, JOÃO M. ; **CABRERA-BAEZ, M**. ; PADRÓN-HERNÁNDEZ, E. ; MARQUES, T. ; GUERRA, Y. ; VIANA, BARTOLOMEU C. ; SANTOS, F.E.P. ; PEÑA-GARCIA, R. . *Preferential site occupancy of Ni ions and oxidation state of Fe ions in the YIG crystal structure obtained by sol-gel method*. **Journal of Alloys and Compounds**, v. 849, p. 156657, 2020. [https://doi.org/10.1016/j.jallcom.2020.156657]
13. **CABRERA-BAEZ, M**.; AVILA, M. A. and RETTORI, C.; *Conduction electrons in aperiodic versus periodic structures: An ESR study of quasicrystalline i-Y(Gd)-Cd and its approximant Y(Gd)Cd_6.* **Physical Review B**, v. 100, p. 014207, 2019. [https://doi.org/10.1103/PhysRevB.100.014207]
14. **CABRERA-BAEZ, M**.; AVILA, M. A. and RETTORI, C. *Gd^{3+} as a probing and tuning tool of strong electronic correlations in the Heavy Fermion Kondo-Lattice $YbFe_2Zn_{20}$.* **Physical Review B**, v. 98, p. 165106, 2018. [https://doi.org/10.1103/PhysRevB.98.165106]

15. **CABRERA-BAEZ, M**.; DENIS, V. C.; MENDONÇA-FERREIRA, L.; CARLONE, M.; VENEGAS, P. A.; AVILA, M. A. and RETTORI, C. *Unusual evolution from a superconducting to an antiferromagnetic ground state in $Y_{1-x}Gd_xPb_3$ ($0 \leq x \leq 1$).* **Physical Review B**, v. 97, p. 224425, 2018. [https://doi.org/10.1103/PhysRevB.97.224425]
16. **CABRERA-BAEZ, M**.; FINATTI, B. F.; RETTORI, C. and AVILA. M. A. *Single crystal growth and characterization of the intermetallic cubic cage system $YCo_{1.82}Mn_{0.18}Zn_{20}$.* **Physica B: Condensed Matter**, v. 536, p. 850, 2018. [https://doi.org/10.1016/j.physb.2017.09.003]
17. **CABRERA-BAEZ, M**.; NARANJO-URIBE, A.; OSORIO-GUILLÉN, J. M.; RETTORI, C.; AVILA, M. A. *Conduction electrons mediating the evolution from antiferromagnetic to ferromagnetic ordering in $Gd(Co_{1-y}Fe_y)_2Zn_{20}$ ($0 \leq y \leq 1$).* **Physical Review B**, v. 95, p. 104407, 2017. [https://doi.org/10.1103/PhysRevB.95.104407]
18. MUNEVAR, J.; **CABRERA-BAEZ, M**.; ALZAMORA, M.; LARREA, J.; BITTAR, E. M.; BAGGIO-SAITOVITCH, E.; LITTERST, F.; J.RIBEIRO, R. A.; AVILA, M. A.; MORENZONI, E. *Magnetic order of intermetallic $FeGa_{3-y}Ge_y$ studied by μSR and 57Fe Mössbauer spectroscopy*. **Physical Review B**, v. 95, p. 125138, 2017. [https://doi.org/10.1103/PhysRevB.95.125138]
19. **CABRERA-BAEZ, M**.; RIBEIRO, R. A.; AVILA, M. A. *Tuning the electronic hybridization in the heavy fermion cage compound $YbFe_2Zn_{20}$ with Cd doping*. **Journal of Physics. Condensed Matter** v. 28, p. 375601, 2016. [https://doi.org/10.1088/0953-8984/28/37/375601]
20. ALVAREZ-QUICENO, J. C.; **CABRERA-BAEZ, M.** ; RIBEIRO, R. A. ; AVILA, M. A. ; DALPIAN, G. M. ; OSORIO-GUILLÉN, J. M. *Emergence of competing magnetic interactions induced by Ge doping in the semiconductor $FeGa_3$.* **Physical Review B**, v. 94, p. 014432-1, 2016. [https://doi.org/10.1103/PhysRevB.94.014432]
21. **CABRERA-BAEZ, M**.; NARANJO-URIBE, A.; OSORIO-GUILLÉN, J. M.; RETTORI, C.; AVILA, M. A. *Multiband electronic characterization of the complex intermetallic cage system $Y_{1-x}Gd_xCo_2Zn_{20}$.* **Physical Review B**, v. 92, p. 214414-1, 2015. [https://doi.org/10.1103/PhysRevB.92.214414]
22. **CABRERA-BAEZ, M**; IWAMOTO, W; MAGNAVITA, E T; OSORIO-GUILLÉN, J M; RIBEIRO, R A; AVILA, M A; RETTORI, C. *Gd spin-lattice relaxation via multiband conduction electrons in $Y_{1-x}Gd_xIn_3$: an electron spin resonance study.* **Journal of Physics. Condensed Matter**, v. 26, p. 175501, 2014. [https://doi.org/10.1088/0953-8984/26/17/175501]
23. **CABRERA-BAEZ, M**.; MAGNAVITA, E T.; RIBEIRO, R. A.; AVILA, M. A. *Thermodynamic and Transport Study of Electron- and Hole-Doped MGa3 Single Crystals (M = Fe, Co).* **Journal of Electronic Materials**, v. 43, p. 1988-1992, 2013. [https://doi.org/10.1007/s11664-013-2932-1]
24. LANDÍNEZ TÉLLEZ, D. A.; **CABRERA-BAEZ, M**.; ROA-ROJAS, J. *Structure and conductivity fluctuations of the $Y_3Ba_5Cu_8O_{18}$ superconductor*. **Modern Physics Letters B**, v. 26, p. 10.1142/S021798, 2012. [https://doi.org/10.1142/S0217984912500674]

TEACHING

Undergraduate Level:

- Lecture: **General Physics II**
  (Equilibrium, Statics, Gravitation, Fluids, Oscillations and Waves, Thermodynamics)

  4h/ week, 2019.1
  4h/ week, 2019.2
  4h/ week, 2020.1 (virtual)
  UFPE – Physics for Engineers

- Lecture: **General Physics III**
  (Electric Field; Electric Potential; Capacitors and Dielectrics; Electric Circuits; Magnetic Field; Amper's Law; Electromagnetic Induction.)

  4h/ week, 2021.2 (virtual)
  4h/ week, 2022.1

UFPE – Physics for Engineers

- Lecture: **Solid State Physics**
  (Solids structures, Bonds, Lattice vibrations and phonons, Thermal properties of solids, Free electron gas in metals, band theory, semiconductors, Fermi surfaces)

  4h/ week, 2020.3
  UFPE – B.S. students in Physics.

Graduate Level:

- Lecture: **Magnetic Properties of Materials**
  4h/ week, 2019.2
  UFPE – MSc and PhD students in Physics.

- Lecture: **Statistical Mechanics**
  5h/ week, 2023.2
  UFPE – MSc and PhD students in Physics

- Lecture: **Condensed Matter Physics**
  4h/ week, 2023.1
  UFPE – MSc and PhD students in Physics

MENTORING EXPERIENCE

Pós-doc supervision

1. Francisco Ronan Viana Araújo, Universidade Federal de Pernambuco, 2022-2023
2. Yosdan Martinez Camejo, Universidade Federal de Pernambuco, 2022-2023.

Ph.D. Thesis and MSc dissertations:

1. Yosdan Martínez Camejo. 2017 - 2021. (PhD in Physics) - Universidade Federal de Pernambuco, Conselho Nacional de Desenvolvimento Científico e Tecnológico. (**advisor**).

2. Kamilla Veronika Rodrigues de Andrade Silva. 2020 - 2023 (PhD in Materials Science) - Universidade Federal de Pernambuco, Conselho Nacional de Desenvolvimento Científico e Tecnológico. (**co-advisor**).

3. Gustavo Henrique Bastos da Silva. 2020 - 2021. (Msc. in Materials Science) - Universidade Federal de Pernambuco, Conselho Nacional de Desenvolvimento Científico e Tecnológico. (**co-advisor**).

4. Juan Camilo Delgado Saavedra. 2020 – 2023. (Msc. in Physics) – Universidad Nacional de Colombia (**co-advisor**)