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EDUCATION

Ph.D. in Condensed Matter Physics

The Federal University of Sao Carlos, Brazil, 2014, with visiting research appointment at Ohio University, Athens, OH, USA

M.S. in Physics

The Federal University of Sao Carlos, Brazil, 2010

B.A. in Physics Education

The Federal University of Sao Carlos, Brazil, 2009

B.S. in Physics

The Federal University of Sao Carlos, Brazil, 2007

PROFESSIONAL APPOINTMENTS

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|----------------|--|
| 2017 - present | Assistant Professor, Department of Physics, University of Richmond, Richmond, VA, USA |
| 2015 - 2017 | Postdoctoral Associate, Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD, USA |
| 2014 - 2015 | Postdoctoral Associate, Department of Physics, The Federal University of Sao Carlos, Sao Carlos, SP, Brazil |
| 2013 | Visiting Researcher Scholar, Department of Applied Physics, University of Wuerzburg, Wuerzburg, Germany |
| 2013 | Visiting Researcher Scholar, Dahlem Center for Complex Quantum Systems, The Free University of Berlin, Berlin, Germany |
| 2011 - 2012 | Visiting Researcher Scholar, Department of Physics & Astronomy, Ohio University, Athens, OH, USA |
| 2008 - 2014 | Graduate Research Fellow, Department of Physics, The Federal University of Sao Carlos, Sao Carlos, SP, Brazil |

RESEARCH INTERESTS

Electronic transport, nanophotonics, plasmonics, design of optical-electro nanostructures, optical properties of metallic and semiconductor nanostructures, structure and electronic properties of: semiconductor nanowires, quantum dots, heterojunctions, and superlattices.

PUBLICATIONS

Refereed Journal Articles

16. "Optoelectronic characterization of Zn_{1-x}Cd_xO thin films as an alternative to photonic crystals in organic solar cells". O. Aguilar, S. de castro, M. P. F. Godoy, and **M. Rebello Sousa Dias**. (2019) **Submitted**
15. "Alloying: a Platform for Metallic Materials with On-Demand Optical Response". O. Aguilar, S. de castro, M. P.F. Godoy, and **M. Rebello Sousa Dias**, and M. S. Leite. *Acc. Chem. Res.* (2019) **Accepted**.
14. "Lithography-free, omnidirectional, CMOS-compatible AlCu alloys for thin film superabsorbers". **M. Rebello Sousa Dias**, C. Gong, Z. A. Benson, M. S. Leite. *Adv. Opt. Mater.* **6**, 1700830 (2018) **Inside front Cover**.

13. “Temperature tuning from direct to inverted bistable electroluminescence in resonant tunneling diodes” F. Hartmann, A. Pfenning, **M. Rebello Sousa Dias**, F. Langer, S. Höfling, M. Kamp, L. Worschech, L. K. Castelano, G. E. Marques, and V. Lopez-Richard. *J. App. Phys.* **122**, 154502 (2017).
12. “Nanoscale Tipping Bucket Effect in a Quantum Dot Transistor-Based Counter” F. Hartmann, P. Maier, **M. Rebello Sousa Dias**, S. Göpfert, L. K. Castelano, M. Emmerling, C. Schneider, S. Höfling, M. Kamp, Y. Pershin, G. E. Marques, V. Lopez-Richard, L. Worschech. *Nano Lett.* **17**, 2273 (2017).
11. “Near-Field Optical Properties of Fully Alloyed Noble Metal Nanoparticles” C. Gong*, **M. Rebello Sousa Dias***, G. Wessler, J. A. Taillon, L. G. Salamanca-Riba, M. S. Leite. *Adv. Opt. Mater.* **5**, 1600568 (2017). (* equal contribution) **Front Cover**.
10. “Mimicking of pulse shape - dependent learning rules with a quantum dot memristor” P. Maier, F. Hartmann, **M. Rebello Sousa Dias**, M. Emmerling, C. Schneider, L. K. Castelano, M. Kamp, S. Höfling, G. E. Marques, V. Lopez-Richard, L. Worschech. *J. Appl. Phys.* **120**, 134503 (2016).
9. “Light sensitive memristor with bi-directional and wavelength-dependent conductance control” P. Maier, F. Hartmann, **M. Rebello Sousa Dias**, M. Emmerling, C. Schneider, L. K. Castelano, M. Kamp, S. Höfling, G. E. Marques, V. Lopez-Richard, L. Worschech. *Appl. Phys. Lett.* **109**, 023501 (2016).
8. “Photocurrent-voltage relation of resonant tunneling diode photodetectors” A. Pfenning, F. Hartmann, **M. Rebello Sousa Dias**, V. Lopez-Richard, L. K. Castelano, F. Langer, S. Höfling, M. Kamp, G. E. Marques, L. Worschech. *Appl. Phys. Lett.* **107**, 081104 (2015).
7. “Nanothermometer Based on Resonant Tunneling Diodes: From Cryogenic to Room Temperatures” A. Pfenning, F. Hartmann, **M. Rebello Sousa Dias**, L. K. Castelano, C. Süßmeier, F. Langer, S. Hofling, M. Kamp, G. E. Marques, L. Worschech, V. Lopez-Richard. *ACS Nano*. **5**, 6271 (2015).
6. “Spin filtering in nanowire directional coupler” **M. Rebello Sousa Dias**, V. Lopez-Richard, G. E. Marques, S. E. Ulloa. *Europhysics Lett.* **106**, 17002 (2014).
5. “Electron transport in quantum dot chains: Dimensionality effects and hopping conductance” V. P. Kunets, **M. Rebello Sousa Dias**, T. Rembert, M. E. Ware, Y. I. Mazur, V. Lopez-Richard, H. A. Mantooth, G. E. Marques, G. J. Salamo. *J. Appl. Phys.* **113**, 183709 (2013).
4. “Tuning hole mobility in InP nanowires” **M. Rebello Sousa Dias**, A. Picinin, V. Lopez-Richard, S. E. Ulloa, L. K. Castelano, J. P. Rino, G. E. Marques. *Appl. Phys. Lett.* **101**, 182104 (2012).
3. “Tailoring Electronic Transparency of Twin-Plane 1D Superlattices” H. Tsuzuki, D. F. Cesar, **M. Rebello Sousa Dias**, L. K. Castelano, V. Lopez-Richard, J. P. Rino, G. E. Marques. *ACS Nano* **5**, 5519 (2011).
2. “Markovian and Non-Markovian Light-Emission Channels in Strained Quantum Wires” V. Lopez-Richard, J. C. Gonzales, F. M. Matinaga, C. Trallero-Giner, E. Ribeiro, **M. Rebello Sousa Dias**, L. Villegas-Lelovsky, G. E. Marques. *Nano Lett.* **9**, 3129 (2009).
1. “Spin-polarization in quantum wires: Influence of Dresselhaus spin-orbit interaction and cross-section effects.” L. Villegas-Lelovsky, C. Trallero-Giner, **M. Rebello Sousa Dias**, V. Lopez-Richard, G. E. Marques. *Phys. Rev. B* **79**, 155306 (2009).

Manuscript in Preparation

1. “Exploring the transport properties of polytypic and twin-plane nanowires: from tunneling phase-time to spin-orbit interaction effects.” **M. Rebello Sousa Dias**, L. K. Castelano, L. Villegas-Lelovsky, V. Lopez-Richard, L. Diago-Cisneros, G. E. Marques.

HONORS & AWARDS

6. 2015 - 2017 Postdoctoral Fellowship from Schlumberger Foundation Faculty for the Future (15% of acceptance rate)
5. 2013 Visiting Researcher Scholarship from German Academic Exchange Service, Germany
4. 2012 Women in Physics Travel Grant Program from IUPAP
3. 2011 - 2012 Visiting Researcher Doctorate Scholarship from CNPq, Brazil

2. 2010 - 2014 Doctorate Scholarship from CNPq, Brazil
1. 2008 - 2010 M. S. Scholarship from Capes, Brazil

INVITED TALKS

10. Bimetallic nanostructures for nanophotonics. James Madison University, Department of Physics, Feb. 2018.
9. Alloyed metallic subwavelength structures for nanophotonics. University of Maryland, Department of Physics, Apr. 2017.
8. Tuning the plasmonic optical properties through alloyed coinage metal nanostructures. The Federal University of Sao Carlos, Department of Physics, May 2016.
7. Dresselhaus spin-orbit effects on transport properties of polytypic nanowires and tunneling phase-time on twin-plane nanowires. Louisiana State University, Department of Physics & Astronomy, Oct. 2015.
6. The study of optical and transport phenomena on semiconductor nanodevices: characterization and application. The Federal University of Lavras, Brazil, May 2015.
5. Electronic and transport phenomena in semiconductor nanostructures. Sao Paulo University, Physics Department of Materials and Mechanics, Brazil, Aug. 2014.
4. Semiconductor nanostructures: fundamental and applied research aiming an efficient technology. International sustainability Days "Euro-Ibsa", Wuerzburg, Germany, Jul. 2014.
3. Transport phenomena in quasi-one-dimensional heterostructures. University of Wuerzburg, Lehrstuhl fur Technische Physik, Germany, Jul. 2014.
2. Transport phenomena in quasi-one-dimensional heterostructures. University of Maryland, Institute for Research in Electronics and Applied Physics, Mar. 2014.
1. Hole mobility in semiconductor nanowires: temperature and strain effects. Ohio University, Department of Physics & Astronomy, Mar. 2011.

CONFERENCE PRESENTATIONS

Oral Contributions

9. O. Aguilar, S. de Castro, M. P. F. Godoy and **M. Rebello Sousa Dias**. Evaluating $Zn_{1-x}Cd_xO$ thin films as transparent conducting oxides. The American Physical Society March Meeting, Boston, MA, 2019.
8. **M. Rebello Sousa Dias**, C. Gong, Z. Benson, M. S. Leite. AlCu Alloyed Thin Films for Perfect Absorbers in a Planar Bilayer Configuration. The American Physical Society March Meeting, Los Angeles, CA, 2018.
7. **M. Rebello Sousa Dias**, C. Gong, G. C. Wessler, M. S. Leite. Alloyed Metallic Nanoparticles for Photovoltaics. Materials Research Society Fall Meeting, Boston, MA, 2016.
6. **M. Rebello Sousa Dias**, C. Gong, G. C. Wessler, M. S. Leite. Metal alloyed nanostructures with tunable optical properties. The American Physical Society March Meeting, Baltimore, MD, 2016.
5. **M. Rebello Sousa Dias**, C. Gong, M. S. Leite. Optical properties of metal alloys through binary mixtures of nanostructures. U.S. - Brazil Young Physicists Forum, Baltimore, MD, 2016.
4. **M. Rebello Sousa Dias**, L. K. Castelano, L. Villegas-Lelovsky, V. Lopez-Richard, L. Diago-Cisneros, G. E. Marques. Dresselhaus spin orbit effects on transport properties of polytypic nanowires. 17^o Brazilian Workshop on Semiconductor Physics, Uberlandia, Brazil, May. 2015.
3. **M. Rebello Sousa Dias**, V. Lopez-Richard, G. E. Marques, S. E. Ulloa., Spin transport on parallel coupled nanowires with Rashba spin-orbit interaction. American Physical Society March Meeting, Denver, CO, 2014.

2. H. Tsuzuki, D. F. Cesar, **M. Rebello Sousa Dias**, L. K. Castelano, V. Lopez-Richard, J. P. Rino, G. E. Marques., Electronic Transparency Tuning of Twin-Plane 1D Superlattices by Strain Fields. International Conference on Superlattices, Nanostructures and Nanodevices, Dresden, Germany, Jul. 2012.
1. **M. Rebello Sousa Dias**, A. Picinin, V. Lopez-Richard, S. E. Ulloa, L. K. Castelano, J. P. Rino, G. E. Marques. Tuning the hole mobility in InP semiconductor nanowires. The American Physical Society March Meeting, Boston, MA, 2012.

Poster Contributions

7. **M. Rebello Sousa Dias**, C. Gong, M. S. Leite. Metal alloyed nanostructures with “on-demand” optical response. Faculty for the Future Fellows Forum, Cambridge/Boston, USA, Nov. 2015.
6. **M. Rebello Sousa Dias**, V. Lopez-Richard, G. E. Marques, S. E. Ulloa. Spin transport properties of parallel coupled nano-wires. Topology and Nonequilibrium in Low-Dimensional Electronic Systems, Max Planck Institute, Dresden, Germany, Sep. 2013.
5. H. Tsuzuki, D. F. Cesar, **M. Rebello Sousa Dias**, L. K. Castelano, V. Lopez-Richard, J. P. Rino, G. E. Marques., Electronic Transparency Tuning of Twin-Plane 1D Superlattices by Strain Fields. International Conference on the Physics of Semiconductors, Zurich, Switzerland, Aug. 2012.
4. **M. Rebello Sousa Dias**, A. Picinin, V. Lopez-Richard, S. E. Ulloa, L. K. Castelano, J. P. Rino, G. E. Marques. Tuning the hole mobility in InP semiconductor nanowires. International Conference on the Physics of Semiconductors, Zurich, Switzerland, Aug. 2012.
3. **M. Rebello Sousa Dias**, V. Lopez-Richard, J. C. Gonzales, F. M. Matinaga, C. Trallero-Giner, E. Ribeiro, L. Villegas-Lelovsky, G. E. Marques. Quantum effects in electronic properties of semiconductor nanowires. XII J. J. Giambiagi Winter School, Buenos Aires, Argentina, 2010.
2. V. Lopez-Richard, J. C. Gonzales, F. M. Matinaga, C. Trallero-Giner, E. Ribeiro, **M. Rebello Sousa Dias**, L. Villegas-Lelovsky, G. E. Marques. Strain induced optical channels with Markov and non-Markovian natures in semiconductor quantum wires. XIV Brazilian Workshop on Semiconductor Physics, Curitiba, Brazil, 2009.
1. **M. Rebello Sousa Dias**, D. Coimbra. Molecular Dynamics Simulation of Dipalmitoylphosphatidylcholine Lipid Monolayers. XXIX National Meeting of Condensed Matter Physics, Brazil, 2006.

Conference talks by students

2. **O. Aguilar**, Suelen de Castro, Marcio. P. F. Godoy, and **M. Rebello Sousa Dias**. Optoelectronic properties of $Zn_{1-x}Cd_xO$ thin films deposited via spray pyrolysis. The American Physical Society March Meeting, Boston, MA, 2019.
1. **A. Q. Rehan**, and **M. Rebello Sousa Dias**. Optical properties of AlAu alloyed and intermetallic thin films. The American Physical Society March Meeting, Boston, MA, 2019

Posters by students

1. **G. Cox**, and **M. Rebello Sousa Dias**. Optical properties of Mn_3O_4 thin film metal oxides. Conference for Undergraduate Women in Physics, Charlottesville, VA, USA, Jan. 2018.

TEACHING EXPERIENCE

University of Richmond, Richmond

- Phys 131 - General Physics with Calculus 1, University of Richmond, Richmond, Fall 2017 and 2018.
- Phys 132 - General Physics with Calculus 2, University of Richmond, Richmond, Spring 2018 and 2019.
- Phys 303 - Classical Mechanics, University of Richmond, Richmond, Spring 2018 and 2019.

University of Maryland, College Park

- Guest Lecturer, Materials for Emerging Technologies, University of Maryland, College Park, Mar. 2017.

- Guest Lecturer, Materials for Emerging Technologies, University of Maryland, College Park, Feb. 2016.
- Guest Lecturer, Engineering for Sustainability, University of Maryland, College Park, Sep. 2016.

The Federal University of Sao Carlos, Brazil

- Lecturer, Physics II, thermodynamics, to sophomore engineering students, The Federal University of Sao Carlos, Brazil, Fall semester 2014.
- Teaching Assistant, Instrumentation for Modern Physics, The Federal University of Sao Carlos, Brazil, Fall semester 2009.

RESEARCH ADVISING AND MENTORING

University of Richmond, Richmond

- Siwant Thapa, Physics, 2019 - present.
- Robbie Kent, Physics, 2019 - present.
- Abdul Rehan, Physics, 2018 - present.
- Gillian Cox, Physics, 2017 - present.
- Omar Aguilar, Physics, 2017 - present.
- Alessandro Serrano, Physics, 2018 - 2019.
- Kylie Britt, Chemistry (now graduate student at NC State University), 2018 - 2019
- Joseph Sterling, high school student (now undergraduate student at University of Richmond), summer 2018

University of Maryland, College Park

- Mentor, Alan Kepler from Materials Science and Engineering, 2016 - 2017.
- Mentor, Anna Park (now undergraduate student at Carnegie Mellon University) 2016 - 2017.
- Co-mentor, Garrett Wessler from Materials Science and Engineering (now NSF fellow and Ph.D. student at Duke University), 2015 - 2016.

The Federal University of Sao Carlos, Brazil

- Co-mentor, PhD Physics candidate (with visiting researcher appointment at Ohio University), 2014.

PROFESSIONAL ACTIVITIES

- Reviewer, NSF Review Panel for Novel Electronics, 2018.
- Reviewer, Murdock College Research Program for Natural Sciences proposals, 2017.
- Panelist, "To Postdoc or Not", Graduate School's May symposium, University of Maryland, 2017.
- Reviewer, International Journal of Modern Physics B.
- Conference Chair, 17^o Brazilian Workshop on Semiconductor Physics, Uberlandia, Brazil, 2015.
- Reviewer, 31st International Conference on the Physics of Semiconductors Proceedings, 2012.
- Round-table Moderator, V Week of Physics, Sao Carlos, SP, Brazil, 2009.
- Teaching Assistant, Prof. Adail Malmegrim Goncalves State School, and Conde do Pinhal State School, Brazil, 2009.
- Co-organizer, II Week of Physics. The Federal University of Sao Carlos, Brazil, 2006.
- Co-organizer, I Week of Physics. The Federal University of Sao Carlos, Brazil, 2005.

OUTREACH

- Volunteer, Big Top Physics booth, USA Science & Engineering Festival, 2016.
- Volunteer, Women In Science and Engineering, Ohio University, 2012.
- Volunteer, Ohio University Open house, 2012.
- Lecturer, Fenix NGO, Brazil, 2007.

PROFESSIONAL MEMBERSHIPS

2016 - present Materials Research Society (MRS)
2011 - present American Physical Society (APS)
2007 - present Brazilian Physical Society (SBF)