

Rebeca L. Ribeiro Palau

Experimental researcher in condensed matter physics, specialist in quantum transport in 2D materials at the CNRS, France.

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Education

- *PhD in Physics* (2009-2013), University of Toulouse, France
French National High Magnetic Field Laboratory-Toulouse (LNCMI-T).
Dissertation: Magneto-transport in graphene nanoribbons.
- *Master in Physics* (2007-2009), Venezuelan Institute for Scientific Research (IVIC), Venezuela.
Degree work: Study of the superconducting order parameter in CePt_3Si and $\text{Mg}_{10}\text{Ir}_{19}\text{B}_{16}$.
- *Bachelor in Physics*(2002-2007), University of Carabobo, Venezuela.

Research experience

- *CNRS tenured researcher* (November 2017 - Present);
Group PHYNANO, Department of Nanoelectronics.
Center for Nanoscience and Nanotechnology.
- *Postdoctoral research scientist at the materials research science and engineering center* (July 2015 - October 2017);
Columbia University, New York City, United States of America.
Supervisors: Prof. Cory Dean and Prof. James Hone.
- *Postdoctoral fellow at the quantum metrology group* (May 2013 - May 2015);
French National Metrology and Testing Laboratory (LNE), Trappes, France.
Supervisors: Dr. Félicien Schopfer and Dr. Wilfrid Poirier.
- *Graduate research assistant* (PhD level, September 2009 - July 2013);
French National High Magnetic Field Laboratory, Toulouse, France.
Advisor: Prof. Bertrand Raquet.
- *Graduate research assistant* (Master level, September 2007 - August 2009);
Undergraduate research assistant (August 2005 - August 2007);
Venezuelan Institute for Scientific Research, Caracas, Venezuela.
Advisor: Dr. Ismarido Bonalde.

Invited seminars to international conferences and schools

14. Graphene 2023, Manchester (UK), June 2023.
13. GEFES2023, Salamanca (Spain), February 2023.
12. Quantum Geometry Advantage workshop, NTU (Singapore), January 2023.
11. DPG spring meeting 2022, Regensburg (Germany), September 2022.

10. 2022 Materials Research Society (MRS) Spring Meeting, Honolulu (USA), May 2022.
9. 24th International Conference on Electronic Properties of Two-Dimensional Systems, November 2021 (online).
8. Graphene 2021, Grenoble (France), October 2021.
7. Moiré in Paris. École Normale Supérieure de Paris (France), June 2019.
6. Frontiers in Condensed Matter. Bristol University (UK), January 2019.
5. Gordon Research Conference on 2D materials. Stonehill (USA), June 2018.
4. GDR-I: International Research Network on Graphene and co, Aussois (France), October 2017.
3. GDR-I: International Research Network on Graphene and Carbon Nanotubes, Aussois (France), December 2015.
2. Workshop on quantum transport in 2D systems. Bagnères de Luchon (France), May 2015.
1. GDR-I: International Research Network on Graphene and Carbon Nanotubes, Lyon (France), January 2012.

Peer-reviewed scientific publications

21. [Non-identical moiré twins in bilayer graphene](#)
E. Arrighi, V.-H. Nguyen, M. Di Luca, G. Maffione, K. Watanabe, T. Taniguchi, D. Maily, J.-C. Charlier, **R. Ribeiro-Palau**
Nature Communications 14, 8178 (2023).
20. [Paramagnetic singularities of the orbital magnetism in graphene with a moiré potential](#)
J. Vallejo Bustamante, **R. Ribeiro-Palau**, C. Fermon, M. Pannetier-Lecoœur, K. Watanabe, T. Taniguchi, R. Deblock, S. Guéron, M. Ferrier, J.N. Fuchs, G. Montambaux, F. Piéchon, H. Bouchiat
Phys. Rev. Letters 131, 116201 (2023).
19. [Quantifying the local mechanical properties of twisted double bilayer graphene](#)
A. Canetta, S. Gonzalez Munoz, V.-H. Nguyen, K. Agarwal, P. De Crombrughe De Picquendaele, Y. Hong, S. Mohapatra, K. Watanabe, T. Taniguchi, B. Nysten, B. Hackens, **R. Ribeiro-Palau**, J.-C. Charlier, O. Kolosov, J. Spiece, P. Gehring
Nanoscale 15, 8134 (2023).
18. [Heat Equilibration of Integer and Fractional Quantum Hall Edge Modes in Graphene](#)
G. Le Breton, R. Delagrèze, Y. Hong, M. Garg, K. Watanabe, T. Taniguchi, **R. Ribeiro-Palau**, P. Roulleau, P. Roche, and F.D. Parmentier
Phys. Rev. Letters 129, 116802 (2022).
17. [Enhancing SiN waveguide optical nonlinearity via hybrid GaS integration](#)
S. Deckoff-Jones, V. Pelgrin, J. Zhang, Ch. Lafforgue, L. Deniel, S. Guerber, **R. Ribeiro-Palau**, F. Boeuf, C. Alonso-Ramos, L. Vivien, J. Hu, and S. Serna
Journal of Optics 23, 025802 (2021).
16. [Disorder in van der Waals heterostructures of 2D materials](#)
D. Rhodes, S.H. Chae, **R. Ribeiro-Palau** and J. Hone
Nature Materials 18, 541 (2019).
15. [High-Quality Electrostatically Defined Hall Bars in Monolayer Graphene](#)
R. Ribeiro-Palau, S. Chen, Y. Zeng, K. Watanabe, T. Taniguchi, J. Hone and C.R. Dean
Nano Letters 19, 2583 (2019).

14. [Competing Fractional Quantum Hall and Electron Solid Phases in Graphene](#)
S. Chen, **R. Ribeiro-Palau**, K. Yang, K. Watanabe, T. Taniguchi, J. Hone, M.O. Goerbig and C.R. Dean
Physical Review Letters 122, 026802 (2019).
13. [Twistable electronics with rotatable structures](#)
R. Ribeiro-Palau, Ch. Zhang, K. Watanabe, T. Taniguchi, J. Hone and C.R. Dean
Science 361, 690 (2018).
12. [Resistivity of Rotated Graphite-Graphene Contacts](#)
T. Chari, **R. Ribeiro-Palau**, C.R. Dean and K. Shepard
Nano Letters 6, 4477 (2016).
11. [Quantum Hall resistance standard in graphene devices under relaxed experimental conditions](#)
R. Ribeiro-Palau R., F. Lafont, D. Kazazis, A. Michon, O. Couturaud, C. Consejo, B. Jouault, W. Poirier and F. Schopfer
Nature Nanotechnology 10, 965 (2015).
10. [Quantum Hall resistance standard based on graphene grown by chemical vapor deposition on silicon carbide](#)
F. Lafont, **R. Ribeiro-Palau**, D. Kazazis, A. Michon, O. Couturaud, C. Consejo, T. Chassagne, M. Zielinski, M. Portail, B. Jouault, F. Schopfer and W. Poirier
Nature Communications 6, 6806 (2015).
9. [Anomalous Dissipation Mechanism and Hall Quantization Limit in Polycrystalline CVD Graphene](#)
F. Lafont, **R. Ribeiro-Palau**, Z. Han, A. Cresti, A. Delvallée, A.W. Cummings, S. Roche, V. Bouchiat, S. Ducourtieux, F. Schopfer and W. Poirier
Physical Review B 90, 115422 (2014).
8. [Strong-coupling BCS superconductivity in noncentrosymmetric BaPtSi₃: A low temperature study](#)
R. Ribeiro-Palau, R. Caraballo, P. Rogl, E. Bauer and I. Bonalde
J. Phys.: Condens. Matter 26, 235701 (2014).
7. [The effect of transverse magnetic field on 1/f noise in graphene](#)
S.L. Rumyantsev, D. Coquillat, **R. Ribeiro**, M. Goiran, W. Knap, M.S. Shur, A.A. Balandin and M.E. Levinshtein
Applied Physics Letters 103, 173114 (2013).
6. [Nodal gap structure in the noncentrosymmetric superconductor LaNiC₂ from magnetic penetration depth measurements](#)
I. Bonalde, **R.L. Ribeiro**, K.J. Syu, H.H. Sung and W.H. Lee
New Journal of Physics 13, 123022 (2011).
5. [Unveiling the Magnetic Structure of Graphene Nanoribbons](#)
R. Ribeiro, J-M. Poumirol, A. Cresti, W. Escoffier, M. Goiran, J-M. Broto, S. Roche and B. Raquet
Physical Review Letters 107, 086601 (2011).
4. [Magnetic Penetration Depth and Gap Symmetry of the Noncentrosymmetric Superconductors CePt₃Si and LaPt₃Si](#)
R.L. Ribeiro, I. Bonalde, Y. Haga, R. Settai and Y. Onuki
Journal of the Physical Society of Japan 78,115002 (2009).
3. [Unusual behaviours and impurity effects in the noncentrosymmetric superconductor CePt₃Si](#)
I. Bonalde, **R.L. Ribeiro**, W. Brämer-Escamilla, C. Rojas, E. Bauer, A. Prokofiev, Y. Haga, B. Yasuda and Y. Onuki
New Journal of Physics 11, 055054 (2009).

2. [Possible two-gap behavior in noncentrosymmetric superconductor \$\text{Mg}_{10}\text{Ir}_{19}\text{B}_{16}\$: A penetration depth study](#)
I. Bonalde, **R.L. Ribeiro**, W. Brämer-Escamilla, G. Mu and H.H. Wen
Physical Review B 79, 052506 (2009).
1. [Isotropically gapped strong-coupling superconductivity in the \$\beta\$ -pyrochlore \$\text{KOs}_2\text{O}_6\$: Evidence from penetration depth measurements](#)
I. Bonalde, **R. Ribeiro**, W. Brämer-Escamilla, J. Yamaura, Y. Nagao and Z. Hiroi
Physical Review Letters 98, 227003 (2007).

Awards

- Ernest Dechelle award from the French Academy of Science (2021).
- 2020 Nicholas Kurti Science Prize for Europe (together with Landry Bretheau).

Grants

- DIM QuantTip grant Mi Lourd 2023 - Q-MAG.
- FlagEra grant 2023 - MAGICTUNE.
- PathFinder IEC 2022 - FLATS.
- FlagEra grant 2019 - TATTOOS.
- ERC starting grant 2019 - TWISTRONICS.
- DIM SIRTEQ grant Mi Lourd 2018 - TOPO2D.
- Humboldt Research Fellowship for Postdoctoral Researchers (declined).
- Gran Mariscal de Ayacucho Foundation, joint Venezuelan Ministry of Science and French Ministry of Foreign Affairs fellowship, program for PhD studies (2009-2013).
- Venezuelan Institute for Scientific Research, Master level fellowship (2007-2009).
- Balseiro Institute, full fellowship for the summer school "Introduction to mesoscopic and nanoscopic physics" held in San Carlos de Bariloche-Argentina (October-November 2006).

Comissions of Trust

- Commissions Consultatives of the University of Paris Saclay (2022- present)
- Scientific board GDR Mesocopies physics (2023 - present)
- Expert for the selection of MSC-IF actions
- Reviewer for the journals: Phys. Rev. Lett., Phys. Rev. Applied, Nature, Nature Electronics, Nature Comms., Science, Nano Letters.
- Reviewer for funding agencies: CERC, GACR and ERC.

Supervised PhD and Postdocs

- 2 PhD students and 4 postdocs since 2017.
- 6 PhD students before 2017.

Thematic schools

- GDR-I HOWDI school, Roscoff (France), September 2023.
- International Winterschool on Electronic Properties of Novel Materials 2023, Kirchberg (Austria), March 2023.
- Tocha Summer School on Topological Bosonics (on line) 2021.

Teaching

- Case of Study Master Quantum Engineering ENS, 2023.
- Practical works master ICFP 2021 and 2023.
- Monitorat ESPCI 2018 - 2019. Electromagnetic waver.

Scientific animation

- Organization of the Mesoscopic physics school cargese 2024.
 - Organization of the Phynano group seminars 2019 to 2023.
 - Organization of the C2N general seminars 2019 and 2020.
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