Publications — Jose L. Lado

150 published articles, 18 preprints and 7 research perspectives

2026

1. Ana Vera Montoto, Jose L. Lado, Adolfo O. Fumega, **Moire Mott correlated mosaics in twisted bilayer 1T-TaS2**, *Nano Letters (2026)*

2. Elizabeth Louis Pereira, Hongwei Li, Andrea Blanco-Redondo, Jose L. Lado, **Topology and criticality in non-Hermitian multimodal optical resonators through engineered losses**, *Phys. Rev. Research 8, 033132 (2026)*

3. Sebastián Domínguez-Calderón, Marcel Niedermeier, Jose L. Lado, Pascal M. Vecsei, **Quantum circuit algorithm for topological invariants of second-order topological many-body quantum magnets**, *Phys. Rev. B 114, 065139 (2026)*

4. David van Driel, Rouven Koch, Vincent P. M. Sietses, Sebastiaan L. D. ten Haaf, Chun-Xiao Liu, Francesco Zatelli, Bart Roovers, Alberto Bordin, Nick van Loo, Guanzhong Wang, Jan Cornelis Wolff, Grzegorz P. Mazur, Tom Dvir, Ivan Kulesh, Qingzhen Wang, A. Mert Bozkurt, Sasa Gazibegovic, Ghada Badawy, Erik P. A. M. Bakkers, Michael Wimmer, Srijit Goswami, Jose L. Lado, Leo P. Kouwenhoven, Eliska Greplova, **Cross-Platform Autonomous Control of Minimal Kitaev Chains**, *PRX Intelligence 1, 013005 (2026)*

5. Koushik Swaminathan, Anouar Moustaj, Jose L. Lado, Sebastiano Peotta, **Parity-dependent double degeneracy and spectral statistics in the projected dice lattice**, *Phys. Rev. B 114, L051108 (2026)*

6. Elizabeth Louis Pereira, Amin Hashemi, Faluke Aikebaier, Hongwei Li, Jose L. Lado, Andrea Blanco-Redondo, **Machine-learning-enabled characterization of individual ring resonators in integrated photonic lattices**, *APL Photonics 11, 076124 (2026)*

7. Alberto M. Ruiz, Cuiju Yu, Diego López-Alcalá, Jose L. Lado, Adolfo O. Fumega, José J. Baldoví, **Electrical Control of Altermagnetism in a Quasi-1D Magnet**, *arXiv:2607.16856v1*

8. Büşra Gamze Arslan, Mohammad Amini, Ziying Wang, Alessandro Orsini, Jose L. Lado, Adolfo O. Fumega, Robert Drost, Peter Liljeroth, **Emergent ferromagnetism in the NiI2-NbSe2 van der Waals heterostructure**, *arXiv:2607.21218v1*

9. Ziying Wang, Ana Vera Montoto, Mohammad Amini, Yuxiao Ding, Jose L. Lado, Robert Drost, Adolfo O. Fumega, Peter Liljeroth, **Interaction-driven electronic ferroelectricity in van der Waals heterostructures**, *arXiv:2607.24087v1*

10. Tiago V. C. Antão, Anouar Moustaj, Yitao Sun, Jose L. Lado, **Tensor network solvers for ultra-large tight-binding Hamiltonians: algorithms and applications**, *arXiv:2607.00991v2*

11. Youqiang Huang, Tiago V. C. Antão, Adolfo O. Fumega, Mikko Turunen, Yi Zhang, Hanlin Fang, Nianze Shang, Juan C. Arias-Muñoz, Fedor Nigmatulin, Hao Hong, Andrew S. Kim, Faisal Ahmed, Hyunyong Choi, Sanshui Xiao, Kaihui Liu, Jose L. Lado, Zhipei Sun, **Observation of tunable chiral spin textures with nonlinear optics**, *Nature Communications 17, 7576 (2026)*

12. Anouar Moustaj, Yitao Sun, Tiago V. C. Antão, Jose L. Lado, **Tensor network approach to momentum-resolved spectroscopy in nonperiodic super-moiré systems**, *Phys. Rev. Research 8, 023282 (2026)*

13. Greta Lupi, Saketh Ravuri, Chenxiao Zhao, Weidan Zhang, Cesare Roncaglia, Renxiang Liu, Xinliang Feng, Daniele Passerone, Pascal Ruffieux, Roman Fasel, Jose L. Lado, Gonçalo Catarina, **Learning Inhomogeneous Heisenberg Hamiltonians in Nanographene Spin Chains**, *arXiv:2606.29281v1*

14. Yitao Sun, Jose L. Lado, Guangze Chen, **Real-space spectral functions of three-dimensional billion-size topological non-Hermitian matter with tensor networks**, *arXiv:2606.16424v2*

15. Tiago V. C. Antão, Yitao Sun, Adolfo O. Fumega, Jose L. Lado, **Tensor network method for real-space topology in quasicrystal Chern mosaics**, *Phys. Rev. Lett. 136, 156601 (2026)*

16. Marcel Niedermeier, Adrien Moulinas, Thibaud Louvet, Jose L. Lado, Xavier Waintal, **Solving the Gross-Pitaevskii equation on multiple different scales using the quantics tensor train representation**, *Phys. Rev. Research 8, 023006 (2026)*

17. Fedor Nigmatulin, Greta Lupi, Jose L. Lado, Zhipei Sun, **Hamiltonian learning for spin-spiral moiré magnets from electronic magnetotransport**, *arXiv:2604.02959*

18. Cuiju Yu, Jose L. Lado, **Intrinsic i-wave altermagnetism in 2D graphene superlattices**, *arXiv:2604.19661*

19. Atif Ghafoor, Santeri Neuvonen, Thinh Tran, Oscar Moreno Segura, Yitao Sun, Yaroslav Pavlyukh, Riku Tuovinen, Jose L. Lado, Shawulienu Kezilebieke, **Atomically Reconfigurable Single-Molecule Optoelectronics**, *arXiv:2603.29286*

20. Anouar Moustaj, Yitao Sun, Tiago V. C. Antão, Lumen Eek, Jose L. Lado, **Tensor-network methodology for super-moiré excitons beyond one billion sites**, *arXiv:2603.02011*

21. Oleksandr Dobrovolskiy, Hermann Suderow, Francesco Tafuri, Annica M. Black-Schaffer, Jose L. Lado, Asle Sudbø, Daniela Stornaioulo, Chuan Li, Anna E. Böhmer, Lan Maria Tran, Andrzej J. Zaleski, Adrian Crisan, Massimiliano Polichetti, Armando Galluzzi, Ali Gencer, Bernd Aichner, Neven Barišić, Wolfgang Lang, Tomas Samuely, Martin Gmitra, Tristan Cren, Mateo Calandra, Peter Samuely, Jeroen Custers, Rosa Córdoba, Vladimir M. Fomin, Nicola Poccia, Pavol Szabó, Fabrizio Porrati, Gleb Kakazei, Jan Aarts, Jason Robinson, Javier E. Villegas, Matthias Althammer, Hans Huebl, Akashdeep Kamra, Mathias Weiler, J. Hugo Dil, Daniil Evtushinsky, Beena Kalisky, Yonathan Anahory, Simon Bending, Peter Liljeroth, Abdou Hassanien, Isabel Guillamón, Edwin Herrera, Alejandro V. Silhanek, Joris Van de Vondel, Anna Palau, Ilya Charaev, Maria Sidorova, Floriana Lombardi, Thilo Bauch, Cheryl Feuillet-Palma, Vasily Stolyarov, Dimitri Roditchev, Vladimir M. Krasnov, Benedikt Hampel, María José Martínez-Pérez, Javier Sesé, Dieter Koelle, Stefano Poletto, Alessandro Bruno, Davide Massarotti, **Roadmap on nanoscale superconductivity for quantum technologies**, *Superconductor Science and Technology 39, 023502 (2026)*

22. Liwei Jing, Mohammad Amini, Adolfo O. Fumega, Orlando J. Silveira, Jose L. Lado, Peter Liljeroth, Shawulienu Kezilebieke, **Strain-induced two-dimensional topological crystalline insulator**, *Nature Communications 17, 817 (2026)*

23. Sharadh Jois, Jose L. Lado, Genda Gu, Qiang Li, Ji Ung Lee, **Coupling of Klein-Andreev Resonant States in BiSrCaCuO-graphene-BiSrCaCuO Devices**, *Phys. Rev. B 113, 035410 (2026)*

24. Petro Maksymovych, Sang Yong Song, Benjamin Lawrie, Wonhee Ko, Jose L. Lado, **Fingerprinting superconductors by disentangling Andreev and quasiparticle currents across tunable tunnel junctions**, *arXiv:2601.20798*

25. Greta Lupi, Adolfo O. Fumega, Mohammad Amini, Robert Drost, Peter Liljeroth, Jose L. Lado, **Molecular Hamiltonian learning from setpoint-dependent scanning tunneling spectroscopy**, *arXiv:2601.19371v1*

2025

1. Yitao Sun, Marcel Niedermeier, Tiago V. C. Antão, Adolfo O. Fumega, Jose L. Lado, **Self-consistent tensor network method for correlated super-moiré matter beyond one billion sites**, *Phys. Rev. Research 7, 043288 (2025)*

2. Mohammad Amini, Linghao Yan, Orlando J. Silveira, Adolfo O. Fumega, Viliam Vaňo, Jose L. Lado, Shawulienu Kezilebieke, Peter Liljeroth, Robert Drost, **Atomic-scale probe of molecular magneto-electric coupling**, *arXiv:2512.07489v1*

3. Faluke Aikebaier, Teemu Ojanen, Jose L. Lado, **Transfer learning of many-body electronic correlation entropy from local measurements**, *Phys. Rev. Applied 24, 054014 (2025)*

4. Ruihuan Fang, Cuiju Yu, Youqiang Huang, Tosson Elalaily, Yuvraj Chaudhry, Yaoqiang Zhou, Andres Castellanos-Gomez, Sanshui Xiao, Jiwon Park, Hyunyong Choi, Fida Ali, Hanlin Fang, Jose L. Lado, Pertti Hakonen, Zhipei Sun, **Controllable Superconductivity in Suspended van der Waals Materials**, *arXiv:2511.05763*

5. Ziying Wang, Adolfo O. Fumega, Ana Vera Montoto, Mohammad Amini, Büşra Gamze Arslan, Aleš Cahlík, Yuxiao Ding, Jose L. Lado, Robert Drost, Peter Liljeroth, **Moiré modulated quantum spin liquid candidate 1T-TaSe2**, *arXiv:2511.03311*

6. Netta Karjalainen, Greta Lupi, Rouven Koch, Adolfo O. Fumega, Jose L. Lado, **Hamiltonian learning quantum magnets with dynamical impurity tomography**, *arXiv:2510.18613*

7. Mohammad Amini, Tiago V. C. Antão, Liwei Jing, Ziying Wang, Antti Karjasilta, Robert Drost, Shawulienu Kezilebieke, Jose L. Lado, Adolfo O. Fumega, Peter Liljeroth, **Observation of electromagnons in a monolayer multiferroic**, *arXiv:2510.08253*

8. Rouven Koch, Robert Drost, Peter Liljeroth, Jose L. Lado, **Hamiltonian learning of triplon excitations in an artificial nanoscale molecular quantum magnet**, *Nano Letters 25, 36, 13435-13440 (2025)*

9. Luigi Camerano, Adolfo O. Fumega, Jose L. Lado, Alessandro Stroppa, Gianni Profeta, **Multiferroic nematic d-wave altermagnetism driven by orbital-order on the honeycomb lattice**, *npj 2D Materials and Applications 9, 75 (2025)*

10. Amin Hashemi, Elizabeth Louis Pereira, Hongwei Li, Jose L. Lado, Andrea Blanco-Redondo, **Observation of non-Hermitian topology from optical loss modulation**, *Nature Materials 24, 1393-1399 (2025)*

11. Fedor Nigmatulin, Jose L. Lado, Zhipei Sun, **Electrical probe of spin-spiral order in quantum spin Hall/spin-spiral magnet van der Waals heterostructures**, *Phys. Rev. B 112, 024430 (2025)*

12. Donglin Li, Nan Cao, Marvin Metzelaars, Orlando J Silveira, Joakim Jestilä, Adolfo Fumega, Tomohiko Nishiuchi, Jose Lado, Adam S Foster, Takashi Kubo, Shigeki Kawai, **Frustration-Induced Many-Body Degeneracy in Spin −1/2 Molecular Quantum Rings**, *J. Am. Chem. Soc., 147, 30, 26208–26217 (2025)*

13. Antonija Grubišić-Čabo, Marcos H. D. Guimarães, Dmytro Afanasiev, Jose H. Garcia Aguilar, Irene Aguilera, Mazhar N. Ali, Semonti Bhattacharyya, Yaroslav M. Blanter, Rixt Bosma, Zhiyuan Cheng, Zhiying Dan, Saroj P. Dash, Joaquín Medina Dueñas, Joaquín Fernández-Rossier, Marco Gibertini, Sergii Grytsiuk, Maurits J. A. Houmes, Anna Isaeva, Chrystalla Knekna, Arnold H. Kole, Samer Kurdi, Jose Lado, Samuel Mañas-Valero, J. Marcelo J. Lopes, Damiano Marian, Mengxing Na, Falk Pabst, Sergio Barquero Pierantoni, Mexx Regout, Riccardo Reho, Malte Rösner, David Sanz, Toeno van der Sar, Jagoda Sławińska, Matthieu J. Verstraete, Muhammad Waseem, Herre S. J. van der Zant, Zeila Zanolli, David Soriano, **Roadmap on quantum magnetic materials**, *2D Materials 12, 031501 (2025)*

14. Greta Lupi, Jose L. Lado, **Hamiltonian learning quantum magnets with non-local impurity tomography**, *Phys. Rev. Applied 23, 054077 (2025)*

15. Lorenz Meyer, Jose L. Lado, Nicolas Néel, Jörg Kröger, **Control of Andreev Reflection via a Single-Molecule Orbital**, *Phys. Rev. Lett. 134, 146201 (2025)*

16. Norma Rivano, Francesco Libbi, Chuin Wei Tan, Christopher Cheung, Jose Lado, Arash Mostofi, Philip Kim, Johannes Lischner, Adolfo O. Fumega, Boris Kozinsky, Zachary A. H. Goodwin, **Exploring Charge Density Waves in two-dimensional NbSe2**, *arXiv:2504.13675*

17. Mohamed Oudah, Daisuke Takegami, Shinji Kitao, Jose L. Lado, Anna Meléndez-Sans, Denise S. Christovam, Masato Yoshimura, Ku-Ding Tsuei, Graham McNally, Masahiko Isobe, Kathrin Küster, M. Seto, Bernhard Keimer, D. A. Bonn, Liu Hao Tjeng, George Sawatzky, Hidenori Takagi, **Charge-entropy-stabilized selenide AgxSn1−xSe**, *Communications Materials 6, 58 (2025)*

18. Zina Lippo, Elizabeth Louis Pereira, Jose L. Lado, Guangze Chen, **Topological zero modes and correlation pumping in an engineered Kondo lattice**, *Phys. Rev. Lett. 134, 116605 (2025)*

19. Kewei Sun, Nan Cao, Orlando J. Silveira, Adolfo O. Fumega, Fiona Hanindita, Shingo Ito, Jose L. Lado, Peter Liljeroth, Adam S. Foster, Shigeki Kawai, **On-surface synthesis of Heisenberg spin-1/2 antiferromagnetic molecular chains**, *Science Advances 11 (9), eads1641 (2025)*

20. Pascal M. Vecsei, Jose L. Lado, **Phase diagram of the J1-J2 Heisenberg second-order topological quantum magnet**, *Phys. Rev. Research 7, 013194 (2025)*

21. Luigi Camerano, Adolfo O. Fumega, Gianni Profeta, Jose L. Lado, **Multicomponent magneto-orbital order and magneto-orbitons in monolayer VCl3**, *Nano Letters 25, 12, 4825–4831 (2025)*

22. Pascal M. Vecsei, Jose L. Lado, Christian Flindt, **Lee-Yang formalism for phase transitions of interacting fermions using tensor networks**, *Phys. Rev. B 111, 075134 (2025)*

23. Xin Huang, Jose L. Lado, Jani Sainio, Peter Liljeroth, Somesh Chandra Ganguli, **Doped Mott phase and charge correlations in monolayer 1T-NbSe2**, *Phys. Rev. Lett. 134, 046504 (2025)*

2024

1. Adolfo O. Fumega, Marcel Niedermeier, Jose L. Lado, **Correlated states in super-moire materials with a kernel polynomial quantics tensor cross interpolation algorithm**, *2D Materials 12 015018 (2024)*

2. Marcel Niedermeier, Marc Nairn, Christian Flindt, Jose L. Lado, **Quantum computing topological invariants of two-dimensional quantum matter**, *Phys. Rev. Research 6, 043288 (2024)*

3. Viliam Vaňo, Stefano Reale, Orlando J. Silveira, Danilo Longo, Mohammad Amini, Massine Kelai, Jaehyun Lee, Atte Martikainen, Shawulienu Kezilebieke, Adam S. Foster, Jose L. Lado, Fabio Donati, Peter Liljeroth, Linghao Yan, **Emergence of Exotic Spin Texture in Supramolecular Metal Complexes on a 2D Superconductor**, *Phys. Rev. Lett. 133, 236203 (2024)*

4. Tiago V. C. Antão, Jose L. Lado, Adolfo O. Fumega, **Electric field control of moire skyrmion phases in twisted multiferroic NiI2 bilayers**, *Nano Letters, 24, 49, 15767-15773 (2024)*

5. Guangze Chen, Jose L. Lado, Fei Song, **Many-body Liouvillian dynamics with a non-Hermitian tensor-network kernel polynomial algorithm**, *Phys. Rev. Research 6, 043182 (2024)*

6. Marcel Niedermeier, Jose L. Lado, Christian Flindt, **Simulating the quantum Fourier transform, Grover's algorithm, and the quantum counting algorithm with limited entanglement using tensor networks**, *Phys. Rev. Research 6, 033325 (2024)*

7. Hao Wang, Peng Fan, Jing Chen, Lili Jiang, Hong-Jun Gao, Jose L. Lado, Kai Yang, **Construction of topological quantum magnets from atomic spins on surfaces**, *Nature Nanotechnology, 19, 1782–1788 (2024)*

8. Pei-Xin Shen, Zhide Lu, Jose L. Lado, Mircea Trif, **Non-Hermitian Fermi-Dirac Distribution in Persistent Current Transport**, *Phys. Rev. Lett. 133, 086301 (2024)*

9. Jan Phillips, Jose L. Lado, Victor Pardo, Adolfo O. Fumega, **Self-doped flat band and spin-triplet superconductivity in monolayer 1T-TaSe2−xTex**, *Journal of Physics: Condensed Matter 36 385804 (2024)*

10. Faluke Aikebaier, Teemu Ojanen, Jose L. Lado, **Machine learning the Kondo entanglement cloud from local measurements**, *Phys. Rev. B 109, 195125 (2024)*

11. Markus Aapro, Abraham Kipnis, Jose L. Lado, Shawulienu Kezibelieke, Peter Liljeroth, **Tuning spinaron and Kondo resonances via quantum confinement**, *Phys. Rev. B 109, 195415 (2024)*

12. Maryam Khosravian, Elena Bascones, Jose L. Lado, **Moire-enabled artificial topological superconductivity in twisted bilayer graphene**, *2D Materials 2,. 11 035012 (2024)*

13. Kai Shao, Hao Geng, Erfu Liu, Jose L. Lado, Wei Chen, D. Y. Xing, **A Non-Hermitian Moiré Valley Filter**, *Phys. Rev. Lett. 132, 156301 (2024)*

14. Elizabeth Louis Pereira, Hongwei Li, Andrea Blanco-Redondo, Jose L. Lado, **Non-Hermitian topology and criticality in photonic arrays with engineered losses**, *Phys. Rev. Research 6, 023004 (2024)*

15. Adolfo O. Fumega, Jose L. Lado, **Nature of the unconventional heavy fermion Kondo state in monolayer CeSiI**, *Nano Letters 24, 14, 4272–4278 (2024)*

16. Sharareh Sayyad, Jose L. Lado, **Transfer learning from Hermitian to non-Hermitian quantum many-body physics**, *Journal of Physics: Condensed Matter, 36 185603 (2024)*

17. Mohammad Amini, Adolfo O. Fumega, Héctor González-Herrero, Viliam Vaňo, Shawulienu Kezilebieke, Jose L. Lado, Peter Liljeroth, **Atomic-scale visualization of multiferroicity in monolayer NiI2**, *Advanced Materials, 2311342 (2024)*

18. Maryam Khosravian, Rouven Koch, Jose L. Lado, **Hamiltonian learning with real-space impurity tomography in topological moire superconductors**, *J. Phys. Mater. 7 015012 (2024)*

19. J. L. Lado, J. Fernández-Rossier, **Theory of edge states in graphene-like systems**, *Encyclopedia of Condensed Matter Physics, 2nd ed., Elsevier, pp. 350-360 (2024)*

2023

1. Shigeki Kawai, Orlando J. Silveira, Lauri Kurki, Zhangyu Yuan, Tomohiko Nishiuchi, Takuya Kodama, Kewei Sun, Oscar Custance, Jose L. Lado, Takashi Kubo, Adam S. Foster, **Local Probe Isomerization in a One-Dimensional Molecular Array**, *Nature Communications 14, 7741 (2023)*

2. Rouven Koch, David van Driel, Alberto Bordin, Jose L. Lado, Eliska Greplova, **Adversarial Hamiltonian learning of quantum dots in a minimal Kitaev chain**, *Phys. Rev. Applied 20, 044081 (2023)*

3. Viliam Vaňo, Somesh Chandra Ganguli, Mohammad Amini, Linghao Yan, Maryam Khosravian, Guangze Chen, Shawulienu Kezilebieke, Jose L. Lado, Peter Liljeroth, **Evidence of nodal superconductivity in monolayer 1H-TaS2 with hidden order fluctuations**, *Advanced Materials (2023)*

4. Wonhee Ko, Sang Yong Song, Jiaqiang Yan, Jose L. Lado, Petro Maksymovych, **Atomic-Scale Andreev Probe of Unconventional Superconductivity**, *Nano Letters 23 (17), 8310-8318 (2023)*

5. Netta Karjalainen, Zina Lippo, Guangze Chen, Rouven Koch, Adolfo O. Fumega, Jose L. Lado, **Hamiltonian inference from dynamical excitations in confined quantum magnets**, *Phys. Rev. Applied 20, 024054 (2023)*

6. Robert Drost, Shawulienu Kezilebieke, Jose L. Lado, Peter Liljeroth, **Real-space imaging of triplon excitations in engineered quantum magnets**, *Phys. Rev. Lett. 131, 086701 (2023)*

7. Pascal M. Vecsei, Christian Flindt, Jose L. Lado, **Lee-Yang theory of quantum phase transitions with neural network quantum states**, *Phys. Rev. Research 5, 033116 (2023)*

8. Andrew Cole, Alenna Streeter, Adolfo O. Fumega, Xiaohan Yao, Zhi-Cheng Wang, Erxi Feng, Huibo Cao, Jose L. Lado, Stephen E. Nagler, Fazel Tafti, **Extreme sensitivity of the magnetic ground-state to halide composition in FeCl3−xBrx**, *Phys. Rev. Materials 7, 064401 (2023)*

9. Sharareh Sayyad, Jose L. Lado, **Topological phase diagrams of exactly solvable non-Hermitian interacting Kitaev chains**, *Phys. Rev. Research 5, L022046 (2023)*

10. Valerii Kachin, Teemu Ojanen, Jose L. Lado, Timo Hyart, **Effects of electron-electron interactions in the Yu-Shiba-Rusinov lattice model**, *Phys. Rev. B 107, 174522 (2023)*

11. Faluke Aikebaier, Teemu Ojanen, Jose L. Lado, **Extracting electronic many-body correlations from local measurements with artificial neural networks**, *SciPost Phys. Core 6, 030 (2023)*

12. Sharadh Jois, Jose L. Lado, Genda Gu, Qiang Li, Ji Ung Lee, **Andreev Reflection and Klein Tunneling in High-Temperature Superconductor/Graphene Junctions**, *Phys. Rev. Lett. 130, 156201 (2023)*

13. Somesh Chandra Ganguli, Markus Aapro, Shawulienu Kezilebieke, Mohammad Amini, Jose L. Lado, Peter Liljeroth, **Visualization of moiré magnons in monolayer ferromagnet**, *Nano Lett. 23, 8, 3412–3417 (2023)*

14. Adolfo O. Fumega, Jose L. Lado, **Moiré-driven multiferroic order in twisted CrCl3, CrBr3 and CrI3 bilayers**, *2D Materials 10 025026 (2023)*

15. Guangze Chen, Fei Song, Jose L. Lado, **Topological Spin Excitations in Non-Hermitian Spin Chains with a Generalized Kernel Polynomial Algorithm**, *Phys. Rev. Lett. 130, 100401 (2023)*

16. Adolfo O. Fumega, Jose L. Lado, **Ferroelectric valley valves with graphene/MoTe2 van der Waals heterostructures**, *Nanoscale ,15, 2181-2187 (2023)*

2022

1. Mohammad Amini, Orlando J. Silveira, Viliam Vaňo, Jose L. Lado, Adam S. Foster, Peter Liljeroth, Shawulienu Kezilebieke, **Control of molecular orbital ordering using a van der Waals monolayer ferroelectric**, *Advanced Materials, 2206456 (2022)*

2. Guangze Chen, Malte Rösner, Jose L. Lado, **Controlling magnetic frustration in 1T-TaS2 via Coulomb engineered long-range interactions**, *J. Phys.: Condens. Matter 34 485805 (2022)*

3. Maryam Khosravian, Jose L. Lado, **Impurity-induced excitations in a topological two-dimensional ferromagnet/superconductor van der Waals moiré heterostructure**, *Phys. Rev. Materials 6, 094010 (2022)*

4. Rouven Koch, Jose L. Lado, **Designing quantum many-body matter with conditional generative adversarial networks**, *Phys. Rev. Research 4, 033223 (2022)*

5. Mikael Haavisto, J. L. Lado, Adolfo O. Fumega, **Topological multiferroic order in twisted transition metal dichalcogenide bilayers**, *SciPost Phys. 13, 052 (2022)*

6. Pascal M. Vecsei, Jose L. Lado, Christian Flindt, **Lee-Yang theory of the two-dimensional quantum Ising model**, *Phys. Rev. B 106, 054402 (2022)*

7. Wonhee Ko, Jose L. Lado, Petro Maksymovych, **Noncontact Andreev Reflection as a Direct Probe of Superconductivity on the Atomic Scale**, *Nano Lett. 22, 10, 4042–4048 (2022)*

8. Tobias M. R. Wolf, Maximilian F. Holst, Manfred Sigrist, Jose L. Lado, **Nonunitary multiorbital superconductivity from competing interactions in Dirac materials**, *Phys. Rev. Research 4, L012036 (2022)*

9. Somesh Chandra Ganguli, Viliam Vaňo, Shawulienu Kezilebieke, Jose L. Lado, Peter Liljeroth, **Confinement-engineered superconductor to correlated-insulator transition in a van der Waals monolayer**, *Nano Letters, 22, 5, 1845–1850 (2022)*

10. Adolfo O. Fumega, J. L. Lado, **Microscopic origin of multiferroic order in monolayer NiI2**, *2D Materials 9 025010 (2022)*

11. Faluke Aikebaier, Tero T. Heikkilä, J. L. Lado, **Controlling magnetism through Ising superconductivity in magnetic van der Waals heterostructures**, *Phys. Rev. B 105, 054506 (2022)*

12. Guangze Chen, Maryam Khosravian, Jose L. Lado, Aline Ramires, **Designing spin-textured flat bands in twisted graphene multilayers via helimagnet encapsulation**, *2D Materials, 9 024002 (2022)*

13. Timo Hyart, Jose L. Lado, **Non-Hermitian many-body topological excitations in interacting quantum dots**, *Phys. Rev. Research 4, L012006 (2022)*

14. Shawulienu Kezilebieke, Viliam Vaňo, Md N. Huda, Markus Aapro, Somesh Chandra Ganguli, Peter Liljeroth, Jose L. Lado, **Moiré-Enabled Topological Superconductivity**, *Nano Lett. 2022, 22, 1, 328-333*

2021

1. Viliam Vaňo, Mohammad Amini, Somesh Chandra Ganguli, Guangze Chen, Jose L. Lado, Shawulienu Kezilebieke, Peter Liljeroth, **Artificial heavy fermions in a van der Waals heterostructure**, *Nature 599, 582–586 (2021)*

2. Pramod Kumar, Guangze Chen, J. L. Lado, **Kondo-lattice-mediated interactions in flat band systems**, *Phys. Rev. Research 3, 043113 (2021)*

3. Guangze Chen, J. L. Lado, **Tunable moire spinons in magnetically encapsulated twisted van der Waals quantum spin-liquids**, *Phys. Rev. Research 3, 033276 (2021)*

4. Timo Kist, Jose L. Lado, Christian Flindt, **Lee-Yang theory of criticality in interacting quantum many-body systems**, *Phys. Rev. Research 3, 033206 (2021)*

5. Rouven Koch, Jose L. Lado, **Neural network enhanced hybrid quantum many-body dynamical distributions**, *Phys. Rev. Research 3, 033102 (2021)*

6. Aline Ramires, Jose L. Lado, **Emulating heavy fermions in twisted trilayer graphene**, *Phys. Rev. Lett. 127, 026401 (2021)*

7. D. Soriano, J. L. Lado, **Spin-orbit correlations and exchange-bias control in twisted Janus dichalcogenide multilayers**, *New J. Phys. 23 073038 (2021)*

8. Antonio L. R. Manesco, Jose L. Lado, **Correlation-induced valley topology in buckled graphene superlattices**, *2D Materials 8 035057 (2021)*

9. E. Cortés-del Río, J.L. Lado, V. Cherkez, P. Mallet, J-Y. Veuillen, J.C. Cuevas, J.M. Gómez-Rodríguez, J. Fernández-Rossier, I. Brihuega, **Observation of Yu-Shiba-Rusinov states in superconducting graphene**, *Advanced Materials, 33(22), 2008113 (2021)*

10. M. Blei, J. L. Lado, Q. Song, D. Dey, O. Erten, V. Pardo, R. Comin, S. Tongay, A.S. Botana, **Synthesis, Engineering, and Theory of 2D van der Waals Magnets**, *Applied Physics Reviews 8, 021301 (2021)*

11. V. Vadimov, T. Hyart, J. L. Lado, M. Möttönen, T. Ala-Nissila, **Many-body Majorana-like zero modes without gauge symmetry breaking**, *Phys. Rev. Research 3, 023002 (2021)*

12. Malte Rösner, Jose L. Lado, **Inducing a many-body topological state of matter through Coulomb-engineered local interactions**, *Phys. Rev. Research 3, 013265 (2021)*

13. Maryam Khosravian, J. L. Lado, **Quasiperiodic criticality and spin-triplet superconductivity in superconductor-antiferromagnet moire patterns**, *Phys. Rev. Research 3, 013262 (2021)*

14. Senna S. Luntama, Päivi Törmä, Jose L. Lado, **Interaction-induced topological superconductivity in antiferromagnet-superconductor junctions**, *Phys. Rev. Research 3, L012021 (2021)*

15. Tobias M. R. Wolf, Oded Zilberberg, Gianni Blatter, Jose L. Lado, **Spontaneous Valley Spirals in Magnetically Encapsulated Twisted Bilayer Graphene**, *Phys. Rev. Lett. 126, 056803 (2021)*

16. Vilja Kaskela, J. L. Lado, **Dynamical topological excitations in parafermion chains**, *Phys. Rev. Research 3, 013095 (2021)*

2020

1. M. Michael Denner, J. L. Lado, Oded Zilberberg, **Anti-chiral states in twisted graphene multilayers**, *Phys. Rev. Research 2, 043190 (2020)*

2. Antonio L. R. Manesco, Jose L. Lado, Eduardo V. Ribeiro, Gabrielle Weber, Durval Rodrigues Jr, **Correlations in the elastic Landau level of spontaneously buckled graphene**, *2D Materials, Volume 8, Number 1 (2020)*

3. Guangze Chen, J. L. Lado, **Impurity-induced resonant spinon zero modes in Dirac quantum spin-liquids**, *Phys. Rev. Research 2, 033466 (2020)*

4. Alejandro Lopez-Bezanilla, J. L. Lado, **Electrical band flattening, valley flux, and superconductivity in twisted trilayer graphene**, *Phys. Rev. Research 2, 033357 (2020)*

5. D. Soriano, J. L. Lado, **Exchange-bias controlled correlations in magnetically encapsulated twisted van der Waals dichalcogenides**, *Journal of Physics D: Applied Physics, Volume 53, Number 47*

6. T. A. Tartaglia, J. N. Tang, J. L. Lado, F. Bahrami, M. Abramchuk, G. T. McCandless, M. C. Doyle, K. S. Burch, Y. Ran, J. Y. Chan, F. Tafti, **Accessing new magnetic regimes by tuning the ligand spin-orbit coupling in van der Waals magnets**, *Science Advances Vol. 6, no. 30, eabb9379 (2020)*

7. E. Cortés-del Río, P. Mallet, H. González-Herrero, J.L. Lado, J. Fernández-Rossier, J.M. Gómez-Rodríguez, J-Y. Veuille, I. Brihuega, **Quantum confinement of Dirac quasiparticles in graphene patterned with subnanometer precision**, *Advanced Materials, 32(30), 2001119 (2020)*

8. J. L. Lado, M. Sigrist, **Solitonic in-gap modes in a superconductor-quantum antiferromagnet interface**, *Phys. Rev. Research 2, 023347 (2020)*

9. V. Goblot, A. Štrkalj, N. Pernet, J. L. Lado, C. Dorow, A. Lemaître, L. Le Gratiet, A. Harouri, I. Sagnes, S. Ravets, A. Amo, J. Bloch, O. Zilberberg, **Emergence of criticality through a cascade of delocalization transitions in quasiperiodic chains**, *Nature Physics 16, 832–836 (2020)*

2019

1. Alejandro Ferrón, Santiago A. Rodríguez, Sergio S. Gómez, Jose L. Lado, Joaquín Fernández-Rossier, **Single spin resonance driven by electric modulation of the g factor anisotropy**, *Phys. Rev. Research 1, 033185 (2019)*

2. J. L. Lado, M. Sigrist, **Detecting non-unitary multiorbital superconductivity with Dirac points at finite energies**, *Phys. Rev. Research 1, 033107 (2019)*

3. J. L. Lado, R. Ortiz, J. Fernández-Rossier, **Emergent quantum matter in graphene nanoribbons**, *Chapter 4 of the book "Graphene Nanoribbons", Edited by A. Tejeda, P. Seneor, L. Brey, IOP Publishing (2019)*

4. Peter Rickhaus, Giulia Zheng, Jose L. Lado, Yongjin Lee, Annika Kurzmann, Marius Eich, Riccardo Pisoni, Chuyao Tong, Rebekka Garreis, Carolin Gold, Michele Masseroni, Takashi Taniguchi, Kenji Wantanabe, Thomas Ihn, Klaus Ensslin, **Gap Opening in Twisted Double Bilayer Graphene by Crystal fields**, *Nano Lett. 19, 12, 8821-8828 (2019)*

5. J. L. Lado, Oded Zilberberg, **Topological spin excitations in Harper-Heisenberg spin chains**, *Phys. Rev. Research 1, 033009 (2019)*

6. T. M. R. Wolf, J. L. Lado, G. Blatter, O. Zilberberg, **Electrically tunable flat bands and magnetism in twisted bilayer graphene**, *Phys. Rev. Lett. 123, 096802 (2019)*

7. A. Lopez-Bezanilla, J. L. Lado, **Defect-induced magnetism and Yu-Shiba-Rusinov states in twisted bilayer graphene**, *Phys. Rev. Materials 3, 084003 (2019)*

8. Aline Ramires, J. L. Lado, **Impurity-induced triple point fermions in twisted bilayer graphene**, *Phys. Rev. B 99, 245118 (2019)*

9. Kai Yang, William Paul, Fabian D. Natterer, Jose L. Lado, Yujeong Bae, Philip Willke, Taeyoung Choi, Alejandro Ferrón, Joaquín Fernández-Rossier, Andreas J. Heinrich, Christopher P. Lutz, **Tuning the Exchange Bias on a Single Atom from 1 mT to 10 T**, *Phys. Rev. Lett. 122, 227203 (2019)*

10. Wei Chen, J. L. Lado, **Interaction driven surface Chern insulator in nodal line semimetals**, *Phys. Rev. Lett. 122, 016803 (2019)*

2018

1. Kai Yang, Philip Willke, Yujeong Bae, Alejandro Ferrón, Jose L. Lado, Arzhang Ardavan, Joaquín Fernández-Rossier, Andreas J. Heinrich & Christopher P. Lutz, **Electrically controlled nuclear polarization of individual atoms**, *Nature Nanotechnology 13, 1120–1125 (2018)*

2. A. Ramires, J. L. Lado, **Electrically tunable gauge fields in tiny-angle twisted bilayer graphene**, *Phys. Rev. Lett. 121, 146801 (2018)*

3. J. L. Lado, M. Sigrist, **Two-dimensional topological superconductivity with antiferromagnetic insulators**, *Phys. Rev. Lett. 121, 037002 (2018)*

4. Dahlia R. Klein, David MacNeill, Jose L. Lado, David Soriano, Efrén Navarro-Moratalla, Kenji Watanabe, Takashi Taniguchi, Soham Manni, Paul Canfield, Joaquín Fernández-Rossier, Pablo Jarillo-Herrero, **Probing magnetism in 2D van der Waals crystalline insulators via electron tunneling**, *Science 360.6394 (2018): 1218-1222*

5. R. Ortiz, N. A. García-Martínez, J. L. Lado, J. Fernández-Rossier, **Electrical spin manipulation in graphene nanostructures**, *Phys. Rev. B 97, 195425 (2018)*

6. J. Brand, S. Gozdzik, N. Néel, J. L. Lado, J. Fernández-Rossier, J. Kröger, **Electron and Cooper-pair transport across a single magnetic molecule explored with a scanning tunneling microscope**, *Phys. Rev. B 97, 195429 (2018)*

7. D. Carvalho, N. A. García-Martínez, J. L. Lado, J. Fernández-Rossier, **Real space mapping of topological invariants using artificial neural networks**, *Phys. Rev. B 97, 115453 (2018)*

8. Philip Willke, Yujeong Bae, Kai Yang, Jose L. Lado, Alejandro Ferrón, Taeyoung Choi, Arzhang Ardavan, Joaquín Fernández-Rossier, Andreas J. Heinrich, Christopher P. Lutz, **Hyperfine interaction of individual atoms on a surface**, *Science 362.6412 (2018): 336-339*

2017

1. Kai Yang, Yujeong Bae, William Paul, Fabian D. Natterer, Philip Willke, Jose L. Lado, Alejandro Ferrón, Taeyoung Choi, Joaquín Fernández-Rossier, Andreas J. Heinrich, Christopher P. Lutz, **Engineering the Eigenstates of Coupled Spin-1/2 Atoms on a Surface**, *Phys. Rev. Lett. 119, 227206 (2017)*

2. J. L. Lado, A. Ferrón, J. Fernández-Rossier, **Exchange mechanism for electron paramagnetic resonance of individual adatoms**, *Phys. Rev. B 96, 205420 (2017)*

3. Riccardo Frisenda, Joshua O. Island, Jose L. Lado, Emerson Giovanelli, Patricia Gant, Philipp Nagler, Sebastian Bange, John M. Lupton, Christian Schüller, Aday Molina-Mendoza, Lucía Aballe, Michael Foerster, Tobias Korn, Miguel Angel Niño, David Perez de Lara, Emilio M. Pérez, Joaquín Fernández-Rossier, Andres Castellanos-Gomez, **Characterization of highly crystalline lead iodide nanosheets prepared by room-temperature solution processing**, *Nanotechnology 28.45 (2017): 455703*

4. F. Finocchiaro, J. L. Lado, J. Fernández-Rossier, **Electrical Detection of Individual Skyrmions in Graphene Devices**, *Phys. Rev. B 96, 155422 (2017)*

5. Luis A. González-Árraga, J. L. Lado, Francisco Guinea, Pablo San-Jose, **Electrically controllable magnetism in twisted bilayer graphene**, *Phys. Rev. Lett. 119, 107201 (2017)*

6. N. A. García-Martínez, J. L. Lado, D. Jacob, J. Fernández-Rossier, **Anomalous magnetism in hydrogenated graphene**, *Phys. Rev. B 96, 024403 (2017)*

7. J. L. Lado, J. Fernández-Rossier, **On the origin of magnetic anisotropy in two dimensional CrI3**, *2D Materials, Volume 4, Number 3 (2017)*

8. Jan Girovsky, Jose L. Lado, Floris E. Kalff, Eleonora Fahrenfort, Lucas J.J.M. Peters, Joaquín Fernández-Rossier, Alexander F. Otte, **Emergence of quasiparticle Bloch states in artificial crystals crafted atom-by-atom**, *SciPost Phys. 2, 020 (2017)*

9. B. Olivera, C. Salgado, J. L. Lado, A. Karimi, V. Henkel, E. Scheer, J. Fernández-Rossier, J.J. Palacios, C. Untiedt, **Electronic Transport in Gadolinium Atomic-Size Contacts**, *Phys. Rev. B 95, 075409 (2017)*

2016

1. J. L. Lado, D. Guterding, P. Barone, R. Valenti, V. Pardo, **Quantum spin Hall effect in rutile-based oxide multilayers**, *Phys. Rev. B 94, 235111 (2016)*

2. J. L. Lado, V. Pardo, **Dirac topological insulator in the dz2 manifold of a honeycomb oxide**, *Phys. Rev. B 94, 115141 (2016)*

3. R. Ortiz, J. L. Lado, M. Melle-Franco, J. Fernández-Rossier, **Engineering spin exchange in non-bipartite graphene zigzag edges**, *Phys. Rev. B 94, 094414 (2016)*

4. J. L. Lado, J. Fernández-Rossier, **Landau Levels in two-dimensional materials using Wannier Hamiltonians obtained by first principles**, *2D Materials. 3 035023 (2016)*

5. F. E. Kalff, M. P. Rebergen, E. Fahrenfort, J. Girovsky, R. Toskovic, J. L. Lado, J. Fernández-Rossier, A. F. Otte, **A kilobyte rewritable atomic memory**, *Nature Nanotechnology 11, 926–929 (2016)*

6. Aday J. Molina-Mendoza, Jose Luis Lado, Joshua Island, Miguel Angel Niño, Lucía Aballe, Michael Foerster, Flavio Y. Bruno, Herre S. J. van der Zant, Gabino Rubio-Bollinger, Nicolas Agraït, Emilio Perez, Joaquín Fernández-Rossier, Andres Castellanos-Gomez, **Centimeter-scale synthesis of ultrathin layered MoO3 by van der Waals epitaxy**, *Chem. Mater., 2016, 28 (11), pp 4042-4051*

7. J. L. Lado, J. Fernández-Rossier, **Unconventional Yu-Shiba-Rusinov states in hydrogenated graphene**, *2D Materials 3 (2), 025001 (2016)*

8. Luis A. González-Árraga, J. L. Lado, F. Guinea, **Topological features of engineered arrays of adsorbates in honeycomb lattices**, *Physica B: Condensed Matter 496, 1-8 (2016)*

2015

1. P. San-Jose, J. L. Lado, R. Aguado, F. Guinea, J. Fernández-Rossier, **Majorana Zero Modes in Graphene**, *Physical Review X 5 (4), 041042 (2015)*

2. J. L. Lado, N. Garcia-Martinez, J. Fernández-Rossier, **Edge states in graphene-like systems**, *Synthetic Metals 210, 56-67 (2015)*

3. A. Ferrón, J. L. Lado, J. Fernández-Rossier, **Electronic properties of transition metal atoms on Cu2N/Cu(100)**, *Phys. Rev. B 92, 174407 (2015)*

4. J. L. Lado, V. Pardo, **Non-collinear vs collinear description of the Ir-based one-t2g -hole perovskite-related compounds: SrIrO3 and Sr2IrO4**, *Phys. Rev. B 92, 155151 (2015)*

5. J. L. Lado, J. Fernández-Rossier, **Quantum Anomalous Hall effect in graphene coupled to skyrmions**, *Phys. Rev. B 92, 115433 (2015)*

6. B. Bryant, R. Toskovic, A. Ferrón, J. L. Lado, A. Spinelli, J. Fernández-Rossier, A. F. Otte, **Controlled complete suppression of single-atom inelastic spin and orbital cotunnelling**, *Nano Letters 15 (10), 6542-6546 (2015)*

7. N. Garcia-Martinez, J. L. Lado, J. Fernández-Rossier, **Quantum spin Hall phase in multilayer graphene**, *Phys. Rev. B 91, 235451 (2015)*

2014

1. J. L. Lado, J. Fernández-Rossier, **Noncollinear magnetic phases and edge states in graphene quantum Hall bars**, *Phys. Rev. B 90, 165429 (2014)*
2. J. L. Lado, J. Fernández-Rossier, **Magnetic edge anisotropy in graphene-like honeycomb crystals**, *Physical Review Letters 113, 027203 (2014)*

2013

1. J. L. Lado, V. Pardo, D. Baldomir, **Ab initio study of Z2 topological phases in perovskite (111) (SrTiO3)7/(SrIrO3)2 and (KTaO3)7/(KPtO3)2 multilayers**, *Phys. Rev. B 88, 155119 (2013)*
2. J. L. Lado, J. W. González, J. Fernández-Rossier, **Quantum Hall effect in gapped graphene heterojunctions**, *Phys. Rev. B 88, 035448 (2013)*

Research perspectives

1. Jose Lado, **Nobel Prize (Quantum Physics in Action)**, *Europhysics News 57, 8 (2026)*
2. Jose Lado, **Nobel prize in physics 2025: Bringing quantum tunneling all the way up to the human scale**, *Europhysics News 56, 27-28 (2025)*
3. Lukas Gallmann, Jose Lado, Jan Meijer, Christophe Rossel, **Quantum science and technology**, *Europhysics News 56, 14 (2025)*
4. Jose L. Lado, **Doping a frustrated correlated van der Waals magnet**, *Nature Materials 23, 1013–1014 (2024)*
5. Jose Lado, **Engineering exotic quantum matter in twisted van der Waals materials**, *Europhysics News 55, 24-27 (2024)*
6. Jose L. Lado, **Putting a twist on spintronics**, *Science, 374, 6571 (2021)*
7. Jose L. Lado, Peter Liljeroth, **A layered unconventional superconductor**, *News & Views, Nature Physics (2021)*