Curriculum vitae Jose Lado

Personal details and date of the CV

Date of the CV: April 11th 2026
Name: Jose Lado
Researcher unique identifier:

- ORCID:
  0000-0002-9916-1589
- Scopus ID
  https://www.scopus.com/authid/detail.uri?authorId=55812927100
- Google Scholar ID:
  https://scholar.google.com/citations?user=Ns-grioAAAAJ&hl=en

Nationality: Spanish
URL for website:

- Personal homepage:
  https://sites.google.com/site/joseluislado/home
- Group homepage:
  https://www.aalto.fi/en/department-of-applied-physics/correlated-quantum-materials-cqm-0

Current employment

2023 – 2027 **Assistant Professor level 2 (fixed-term)**
Department of Applied Physics, Aalto University, Finland

Awards and honours

2025 - 2030 ERC Consolidator Grant, European Research Council
2020 - 2025 Academy of Finland Research Fellow, awarded by Academy of Finland
2017 - 2019 ETH Postdoctoral Fellowship, ETH Zurich, Switzerland
2024 2DM Young Scientist Award, awarded by IOP
2023 Early Career Theory Award, awarded by the Royal Spanish Physics Society – BBVA Foundation
2023 EPS Early Career Award, awarded by the European Physical Society
2021 Early Career Award (runner-up), awarded by DPG & IOP through NJP
2016 Best Ph.D. Thesis in Theoretical Condensed Matter Physics, awarded by the Spanish Royal Society of Physics, Spain
2016 Extraordinary Doctorate Prize, University of Santiago de Compostela, Spain

Previous work experience

2019 – 2023 **Assistant Professor level 1**
Department of Applied Physics, Aalto University, Finland
2017 – 2019 **ETH Postdoctoral Fellow**
Institute for Theoretical Physics, ETH Zurich, Switzerland
2016 – 2017 **Research Fellow**
International Iberian Nanotechnology Laboratory, Braga, Portugal
2013 – 2016 **Marie Curie-Skłodowska Early Stage Researcher**
International Iberian Nanotechnology Laboratory,, Braga, Portugal

Degrees

2013 – 2016 **Ph.D. in Material Science**
Department of Applied Physics, University of Santiago de Compostela, Spain
2012 – 2013 **Master degree in Material Science and Technology**
Department of Applied Physics, University of Santiago de Compostela, Spain
2007 – 2012 **Bachelor degree in Physics**
Department of Applied Physics, University of Santiago de Compostela, Spain

Research output

I have authored more than 120 peer-reviewed publications. Among others, I authored 16 Physical Review Letters, 1 Physical Review X, 3 Nature Nanotechnology, 1 Nature Materials, 1 Nature Physics, 9 Nano Letters, 6 Advanced Materials, 2 Science Advances, 1 Nature and 2 Science. Bibliometrics: I have been cited 6700 times and I have a h-index of 37 according to Google Scholar (Fig. 1).

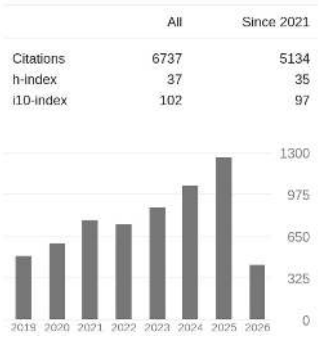

Figure 1: Google Scholar citation count on April 11th 2026

Ph.D. supervision

Graduated:
5 Ph.D. researchers (Guangze Chen, 2019-2023, Maryam Khosravian 2020-2024, Rouven Koch 2020-2024, Pascal Vecsei 2021-2025, Marcel Niedermeier 2021-2025)
Ongoing:
8 Ph.D. researchers (Elizabeth Pereira, Tiago Antao, Greta Lupi, Ana Vera, Yitao Sun, Alessandro Orsini, Henrik Stenbrink, Curie Lee)

Teaching merits

Pedagogical training: *27* credits of pedagogical training completed at Aalto University
Teaching experience

2025-today Responsible teacher, Advanced Quantum Materials (M.Sc.), Aalto University, Finland.
2024-today Co-responsible teacher, Adv. Comp. Methods in Physics (M.Sc.), Aalto University, Finland
2020-2024 Responsible teacher, Solid State Physics (M.Sc.), Aalto University, Finland.
2022 Main lecturer of the 31st Jyväskylä Summer School: "Emergent quantum matter in artificial 2D materials"
2023 Co-lecturer of the school “Emergent phenomena in van der Waals heterostructures”, Tata Institute of Fundamental Research, Mumbai, India
2023 Co-lecturer of the school “Advanced Physics of van der Waals heterostructure”, Roscoff, France
2018-2019 Teaching assistant at ETH Zurich, Switzerland (“Many-body quantum transport”, “Physics in the Smartphone”, and “Quantum field theoretical methods for mesoscopic transport”)

External competitive funding as PI

5 M€ since 2019, including 2.1M€ from Research Council of Finland (2020-2030), 440k€ from the Jane and Aatos Erkko Foundation (2021-2025), and 2M€ from European Research Council Consolidator Grant (2025-2030).

Other key academic merits

Reviewing activities

Proposals	External reviewer for FLAG-ERA JTC 2019 - Graphene Flagship, Israel Science Foundation, U.S.-Israel Binational Science Foundation, NSN Poland, U.S. Department of Energy, FWF Austrian Science Fund, Swiss Science Foundation, European Research Council
Dissertations	External reviewer in 9 Ph.D. defenses since 2020, in Switzerland (2), Spain (4), Sweden (1), Netherlands (2).
Manuscripts	Peer reviewer (total of 143 papers) in Science, Nature, Nature Physics, Nature Materials, Nature Communications, Nature Reviews Materials, Physical Review X, Physical Review Letters, Physical Review Research, and 2D Materials.

Local service in Aalto and Finland (selected)

2026-today	Vice-director of the Centre of Excellence in Quantum Materials, Finland
2022-today	Leader of ResQ Quantum Materials, InstituteQ, Finland
2024-today	Program leader of the Quantum Materials work package of the Finnish Quantum Flagship
2024-2025	InstituteQ colloquium coordinator, Finland
2020-2022	Equality and Quality group member of the School of Science, Aalto University, Finland
2020-2022	Professor's Council, working group member, Aalto University

Teaching service (selected)

2020-2024	Midterm review coordinator, Department of Applied Physics, Aalto
2023	Academic advisor for M.Sc. and B.Sc. students
2023	Degree Programme Committee member (deputy) in Engineering Physics
2023	Materials Physics taskforce coordinator for the curriculum development

International service (selected)

2025-today	Early Career Advisor of Physical Review Letters, American Physical Society
2023-today	Elected member of the CMD board, European Physics Society
2022-today	Management committee member of the COST Action CA21144, Finland
2020-2024	CECAM-FI Node director, Finland (https://cecam.aalto.fi/)

Organization of scientific meetings (selected)

2026	Co-Chair of Physics Days, annual meeting of the Finnish Physical Society, Finland
2024	European School on Superconductivity and Magnetism in Quantum Materials, Spain
2024	CMD31 minicolloquium "Moiré, super-moiré and quasiperiodic quantum matter in twisted van der Waals heterostructures"
2023	InstituteQ Annual Symposium, Finland
2023	CMD30 minicolloquium "Ferroic and multiferroic van der Waals materials"
2022	CECAM SMMART Workshop, Aalto University, Finland
2020-2023	Atomic-scale Quantum Materials colloquium (https://asqm-colloquium.aalto.fi/)

Scientific impact

- I have given 50 invited talks since 2019 in leading international conferences/workshops. Full list available here
- I have written invited perspectives articles in two-dimensional materials in Nature Physics, Nature Materials and Science.
- I am the main developer of several scientific open-source packages with wide impact:
  - pyqula: Python library to study tight-binding models.
  - dmrgpy: Python library to study many-body quantum models with tensor network techniques.
  - Quantum Lattice: User interface to study tight-binding models.

Research highlights

Highlight #1. Design and realization heavy-fermion physics in van der Waals materials

Description: Heavy-fermion materials represent one of the paradigmatic correlated states of matter, represents the starting point for realizing a variety of exotic states of matter, however their emergence requires rare-earth elements featuring f-electrons. In particular, until 2021, heavy-fermion physics was never observed in two-dimensional materials, nor van der Waals heterostructures. In the paper Phys. Rev. Lett. 127, 026401 (2021), we provided the first theoretical proposal for the emergence of a heavy-fermion state in twisted graphene trilayers, showing that its full correlated phase diagram can be explored in a single sample by means of an interlayer bias. This result has been highlighted in Materials Today. Furthermore, in the paper Nature 599, 582–586 (2021), in collaboration with an experimental group, we provided the first experimental demonstration of a heavy-fermion state in a twisted dichalcogenide bilayer. This result has been highlighted in Physics Today. These results provide the first theoretical and experimental demonstration of heavy-fermion physics in twisted van der Waals heterostructures. Finally, in 2024 in a manuscript published in Nano Letters, we demonstrated the emergence of heavy-fermion Kondo lattice behavior in the first van der Waals monolayer material, CeSiI.

Impact: These results demonstrate that van der Waals multilayers allow realizing correlated states so far only observed in rare-earth compounds, opening a new direction in the field of correlated van der Waals materials.

Highlight #2. Engineering moiré quantum matter in twisted van der Waals multilayers

Description: Twisted graphene multilayers have experimentally demonstrated the potential to explore correlated physics, topological states and unconventional superconductivity. In particular, the experimental demonstration of correlated physics and superconductivity in twisted graphene bilayers in 2018 has led to the new field of correlated twistronics. First, in the paper Phys. Rev. Lett. 119, 107201 (2017), we demonstrated that twisted graphene bilayers show correlated states that can be controlled with an electric interlayer bias. Second, in the paper Phys. Rev. Lett. 123, 096802 (2019), we showed that a correlated regime in twisted bilayers can be controlled by electrically generating topological currents,. Finally, in the paper Phys. Rev. Lett. 121, 146801 (2018), we showed that, in twisted graphene bilayers with a tiny rotation angle, an electric bias creates an electrically controllable artificial gauge field. This finding was highlighted in the PRL cover and the APS calendar of 2019, and was demonstrated experimentally in Phys. Rev. Lett. 129, 076803 (2022). Finally, in collaboration with an experimental group, in Nano Letters 22, 1, 328–333 (2022) I experimentally demonstrated an artificial moiré topological superconductor in a twisted van der Waals heterostructure.

Impact: These results provided major results in the field of twisted van der Waals materials, putting forward influential strategies for realizing exotic tunable quantum matter in twisted moiré heterostructures.

Highlight #3: Controllable quantum matter in multiferroic van der Waals heterostructures

Description: Magnetic van der Waals materials have recently risen as versatile systems systems that provide spin control for quantum matter engineered in artificial van der Waals heterostructures. I showed in Phys. Rev. Lett. 126, 056803 (2021) that magnetic encapsulation triggers new valley correlated states in twisted graphene multilayers. We experimentally demonstrated that spin-orbit engineering allows controlling the magnetic interactions in two-dimensional magnets in Science Advances 6, 30, eabb9379 (2020). Furthermore, in 2D Materials 9 025010 (2022), I demonstrated the origin of multiferroic order in monolayer NiI_2, and in collaboration with an experimental group, in Advanced Materials, 2311342 (2024) we demonstrated the emergence of multiferroicity at the atomic level. In 2D Materials 10 (2), 025026 (2023) I established a mechanism to create tunable artificial multiferroics with twisted 2D materials, establishing pioneering results in multiferroic van der Waals materials. These findings have led a collaboration with an experimental group demonstrating multiferroicity in NiI_2 with scanning tunnelling microscopy in Advanced Materials, 2311342 (2024).

Impact: These results establish new strategies to design materials with two-dimensional magnetic materials, establishing pioneering results in twisted spinorbitronics and multiferroic van der Waals heterostructures.