Adrián Franco Rubio

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Work experience

Sep '24 – present	Postdoctoral researcher, University of Vienna (Austria)
Sep '20 – Aug '24	Postdoctoral researcher, Max Planck Institute of Quantum Optics (Germany)
	Humboldt Postdoctoral Fellow (Sep '21 - Aug '23).

Education

Sep '16 – Aug '20	Ph.D. in Physics, Perimeter Institute for Theoretical Physics and University of Waterloo (Canada).
	Thesis: Renormalization, Entanglement and Continuous Tensor Networks
	Supervisor: Guifré Vidal
Aug '15 – Jun '16	M.Sc. in Physics "Perimeter Scholars International", Perimeter Institute for Theoretical Physics and University of Waterloo (Canada).
Sep '12 – Jul '16	B.Sc. in Mathematics, University of Zaragoza (Spain)
Sep '11 – Jul '15	B.Sc. in Physics, University of Zaragoza (Spain)

Publications

1. B. Schiffer, A.F.R., R. Trivedi, J.I. Cirac, *The quantum adiabatic algorithm suppresses the proliferation of errors,* arXiv:2404.15397.
2. R. Trivedi, A.F.R., J.I. Cirac, *Quantum advantage and stability to errors in analogue quantum simulators*, Nat Commun 15, 6507 (2024).
3. A.F.R., J.I. Cirac, *Gaussian matrix product states cannot efficiently describe critical systems,* Phys. Rev. B 106 (23), 235136.
4. A.F.R., *Entanglement renormalization for quantum fields with boundaries and defects*, Phys. Rev. B 104, 125131.
5. Q. Hu, A.F.R., G. Vidal*, Emergent universality in critical quantum spin chains: entanglement Virasoro algebra,* arXiv:2009.11383.
6. A.F.R., G. Vidal, *Entanglement renormalization for gauge invariant quantum fields*, Phys. Rev. D 103, 025013.
7. Q. Hu, A.F.R., G. Vidal, *Continuous tensor network renormalization for quantum fields*, arXiv:1809.05176.
8. A.F.R., G. Vidal, *Entanglement and correlations in the continuous multi-scale entanglement renormalization ansazt,* J. High Energ. Phys. (2017) 12, 129.

Conference contributions

Talk, Workshop on Tensor Networks for Chiral Topological Phases, Abingdon, UK, 2023
Poster, Tensor Networks, ICMAT, Madrid, 2023
Poster, Mathematical Structure of Tensor Networks, Erwin Schrödinger Institute, Vienna, 2022

Talk, QMATH 15, UC Davis, USA, 2022
Poster, Quantum Simulation: Gauge fields, Holography & Topology, UPV-EHU, Bilbao, 2019
Talk, Quantum Information and String Theory, Yukawa Institute, Japan, 2019
Poster, Simons Many Electron Collaboration Annual Meeting, Flatiron Institute, New York, 2019
Talk, Theory Canada 12, Universidad de York, Canada, 2017
Poster, Tensor Networks for Quantum Field Theories II, Perimeter Institute, 2017

Seminars

Quantum Glue seminar, University of the Basque Country, Spain, 2023
QUINFOG group seminar, IFF, Madrid, Spain, 2023
Quantum Group seminar, University of Ghent, Belgium, 2022
Physical Sciences seminar, ISTA, Austria, 2020
Quantum@X seminar, X, the moonshot factory, Mountain View, USA, 2019
Quantum Group seminar, University of Ghent, Belgium, 2022
QuSoft seminar, University of Amsterdam, The Netherlands, 2019
Theory Group seminar, Max Planck Institute for Quantum Optics, Germany, 2019
Gravity, Quantum Fields and Information virtual seminar, Albert Einstein Institute, 2019
Relativistic Quantum Information Group Seminar, IQC, Waterloo, 2015

Teaching experience

Max Planck Institute for Quantum Optics (student supervision)
Doctoral stay: R. Ibarrondo (University of the Basque Country), 2023
Bachelor Thesis: M. Hanisch, *Space-efficient Quantum Computation with Gaussian Systems* (Ludwig Maximilian University Munich) (cosupervised with J. I. Cirac), 2022
Undergrad internship: O. Baldrís (Polytechnic University of Catalonia, La Pedrera Foundation), 2022

Perimeter Institute for Theoretical Physics
Teaching Assistant, PHYS 601 (Quantum Field Theory I, PSI Masters Program), 2018
Teaching Assistant, PHYS 111 (Physics I), 2018

University of Zaragoza
Mathematical olympiad trainer at the Workshop for Mathematical Talent, University de Zaragoza, 2011-2014

Referee for

Quantum, Scipost, Nature Communications, Nature Physics

Honors and awards

Humboldt Postdoctoral Fellowship, Alexander von Humboldt Foundation, 2021
National Award for Excellence in Academic Performance, 2015 and 2016
AGM Prize for the Best Academic Performance in the Faculty of Science of Zaragoza, 2015 and 2016
La Caixa Postgraduate Fellowship, 2015
Perimeter Scholars International Award, Perimeter Institute, 2015
5th Place, II PLANCKS University Physics League (Spanish Team Leader), The Netherlands, 2015
1st Place, Barcelona Tech Mathematical Competition for University Students, 2015

Collaboration Scholarship, Spanish Ministry of Education, 2014
Two Second Prizes and a Third Prize, XIX, XX and XXI International Mathematical Competition for University Students, Blagoevgrad, Bulgaria, 2012, 2013, 2014
Two bronzes and a silver medal, XIV, XVI and XVII Iberoamerican Olympiad of University Mathematics, 2011, 2013, 2014
Excelence Award, University of Zaragoza (2011-2015)
Silver Medal, XLII International Physics Olympiad (IPhO), Bangkok, Tailandia, 2011
Gold Medal, XV Iberoamerican Physics Olympiad, Panama, 2010

Schools and courses

Prospects in Theoretical Physics: Great problems in biology for physicists, Institute of Advanced Studies, Princeton, 2019
CIMPA Research School on Quantum Symmetries, Universidad de los Andes, Bogotá, 2019
17th NCGOA Spring Institute "Algebra and Geometry Quantized and Quantified", Vanderbilt University, 2019
Subfactors: Planar algebras, quantum symmetries, and random matrices, Mathematical Sciences Research Institute, Berkeley, 2017
Summer School on Current Topics in Mathematical Physics, Fields Institute, Toronto, 2018
It from Qubit Summer School, Perimeter Institute, 2016
Quantum Groups in Quantum Gravity, Perimeter Institute & University of Waterloo, 2016
Utrecht Summer School in Theoretical Physics, University of Utrecht, 2014
Summer School in Particle Physics and Astrophysics, Laboratoire d'Annecy de Physique de Particules (LAPP), 2014

Research internships

MultiDark project, ANAIS experiment, University of Zaragoza and Canfranc Underground Laboratory, Sep 2014

Other

Student Representative at the Theoretical Physics Department Council, University of Zaragoza, 2013-2015
Representative at the University of Zaragoza of Matgazine (student-led mathematical magazine), 2014-2015

Languages Spanish (native), English, French, German

Programming languages Mathematica, Julia