CV — José Ramón Martínez Saavedra

José Ramón Martínez Saavedra

José Ramón Martínez Saavedra

VP of Innovation · Lead Scientist | Quside Technologies | Barcelona, Spain
Email: jrmsaavedra@gmail.com | GitHub | LinkedIn | Web

Professional Experience

Quside Technologies S.L. — VP of Innovation · Lead Scientist (2018 – Present)

- Research leadership in quantum random number generation, photonics, and cybersecurity
- IP portfolio management — 30+ patent families (co-inventor in 8 across US, EP, CN, JP)
- PI of Horizon Europe project RPU (€3.9M) and CDTI project PICNET (€1.75M)
- Technology transfer from fundamental research to market-ready products

---

Education

Period	Degree	Institution
2024–2025	**MBA**	Valar Institute (Quantic School of Business and Technology), Washington, DC
2014–2018	**PhD in Photonics** (*Cum Laude*)	Universitat Politècnica de Catalunya (UPC) / ICFO. Director: F. Javier García de Abajo
2013–2014	**MSc in Photonics**	UPC, UAB, UB, ICFO
2008–2013	**Licenciado en Física** (Fundamental Physics)	Universidad Complutense de Madrid
2018–Present	**Grado en Derecho** (in progress)	Universitat Oberta de Catalunya

---

Publications

2026

- **Lindbladian Learning with Neural Differential Equations.** T Heightman, R Aseguinolaza Gallo, E Jiang, **JRM Saavedra**, A Acín, M Płodzień. *arXiv:2603.07778* (2026).

2025

- **Integration of quantum random number generators with post-quantum cryptography algorithms.** PA Blanco, LT Vidarte, MR Casas, **JRM Saavedra**, F de la Iglesia. *arXiv:2507.00658* (2025).

2024

- **Comparing pseudo- and quantum-random number generators with Monte Carlo simulations.** D Cirauqui, MÁ García-March, [...], **JRM Saavedra**, ... *APL Quantum* 1, 036125 (2024).
- **Population annealing with topological defect driven nonlocal updates for spin systems with quenched disorder.** D Cirauqui, MÁ García-March, **JRM Saavedra**, M Lewenstein, ... *Physical Review B* 109, 144202 (2024).

2023

- **Loophole-free Bell inequality violation with superconducting circuits.** S Storz, [...], **J Martínez**, ... *Nature* 617, 265–270 (2023).

2022

- **Haake–Lewenstein–Wilkens approach to spin-glasses revisited.** M Lewenstein, D Cirauqui, MÁ García-March, GG i Corominas, **JRM Saavedra**, ... *J. Phys. A* 55 (45), 454002 (2022).
- **Quadratic unconstrained binary optimization via quantum-inspired annealing.** J Bowles, A Dauphin, P Huembeli, **J Martínez**, A Acín. *Physical Review Applied* 18, 034016 (2022).
- **Quantum random number generators: benchmarking and challenges.** D Cirauqui, MÁ García-March, GG Corominas, T Graß, PR Grzybowski, **JRM Saavedra**, ... *arXiv:2206.05328* (2022).

2019

- **Quantum computing with graphene plasmons.** I Alonso Calafell, JD Cox, M Radonjić, **JRM Saavedra**, FJ García de Abajo, ... *npj Quantum Information* 5 (1), 37 (2019).
- **Imaging the Renner–Teller effect using laser-induced electron diffraction.** K Amini, M Sclafani, T Steinle, AT Le, A Sanchez, C Müller, J Steinmetzer, **JRM Saavedra**, ... *PNAS* 116 (17), 8173–8177 (2019).
- **Visible Optical Resonances in Electrically Doped DNA. JRM Saavedra**, FJ García de Abajo. *ACS Photonics* 6 (4), 932–938 (2019).

2018

- **Optical harmonic generation in monolayer group-VI transition metal dichalcogenides.** A Autere, H Jussila, A Marini, **JRM Saavedra**, Y Dai, A Säynätjoki, ... *Physical Review B* 98 (11), 115426 (2018).
- **Peel-and-Stick Sensors Powered by Directed Radio-Frequency Energy.** D Eric Schwartz, CJ Smith, J Lee, S Priya Gowri, G Daniel, C Lalau-Keraly, **JRM Saavedra**, ... *J. Electronic Packaging* 140 (2), 020904 (2018).
- **Enhanced graphene nonlinear response through geometrical plasmon focusing. JRM Saavedra**, FJ García de Abajo. *Applied Physics Letters* 112, 061107 (2018).

- **Classical and quantum aspects of the optical response at the nanoscale.** (PhD Thesis) **JR Martínez Saavedra**. *Universitat Politècnica de Catalunya*. Cum Laude.

2017

- **Analytical modeling of graphene plasmons.** R Yu, JD Cox, **JRM Saavedra**, FJ García de Abajo. *ACS Photonics* 4 (12), 3106–3114 (2017).
- **Strong plasmon-phonon splitting and hybridization in 2D materials revealed through a self-energy approach.** M Settnes, **JRM Saavedra**, KS Thygesen, AP Jauho, FJ García de Abajo, NA Mortensen. *ACS Photonics* 4 (11), 2908–2915 (2017).
- **Intrinsic plasmon–phonon interactions in highly doped graphene: A near-field imaging study.** FJ Bezares, AD Sanctis, **JRM Saavedra**, A Woessner, P Alonso-González, ... *Nano Letters* 17 (10), 5908–5913 (2017).

2016

- **Hot-electron dynamics and thermalization in small metallic nanoparticles. JRM Saavedra**, A Asenjo-Garcia, FJ García de Abajo. *ACS Photonics* 3 (9), 1637–1646 (2016).
- **Smith-Purcell radiation emission in aperiodic arrays. JRM Saavedra**, D Castells-Graells, FJ García de Abajo. *Physical Review B* 94 (3), 035418 (2016).

2015

- **Phonon excitation by electron beams in nanographenes. JRM Saavedra**, FJ García de Abajo. *Physical Review B* 92 (11), 115449 (2015).

2014

- **Effect of Electron-phonon Coupling on the Lifetimes of Plasmons in Graphene Nanoislands.** (MSc Thesis) **JRM Saavedra**. *Universitat Politècnica de Catalunya* (2014).

Patents

Patent families, ordered by priority date. Co-inventor in all listed families.

- **Method and apparatus for the acceleration of randomized workloads** (2023). C Abellán Sánchez, JRM Saavedra, I Perez Rojo. *WO 2025/093569 A1.*
- **Methods, devices, and systems for the gathering, processing, and distribution of entropy-related metrics** (2023). C Abellán Sánchez, MR Casas, F de la Iglesia Medina, JRM Saavedra. *US 2025/0138785 A1.*
- **Computer-implemented method for transforming a bit stream into a floating-point number** (2022). JRM Saavedra, C Abellán Sánchez. *EP 4310666 A1; WO 2024/017907 A1.*
- **Computer-implemented method for finding an approximate solution for a QUBO problem** (2021). J Bowles, P Huembeli, A Dauphin, J Martínez. *EP 4123480 A1.*
- **Computer-implemented method for deciding whether a random number is larger or smaller than a given threshold** (2020). C Abellán Sánchez, JRM Saavedra, F Tebbenjohanns. *EP 3859520 B1.*
- **Computer-implemented method for obtaining a cumulative distribution function from a signal** (2020). C Abellán Sánchez, JRM Saavedra, M Ferran. *EP 3937005 B1.*

- **Compact device for generating random numbers** (2019). C Abellán Sánchez, JRM Saavedra, W Amaya, D Tulli. *EP 3731081 B1.*
- **Angle-insensitive multi-wavelength optical filters with hue control** (2018). JRM Saavedra, K Thyagarajan. *US 10,928,569 B2.*

Research Projects

- **RPU — Quantum-based Randomness Processing Units for HPC and Data Security** *(completed).* PI (Quside). Horizon Europe — EIC. Grant Agreement 101145131. €3.9M. 03/2024–02/2026.
- **PICNET — Circuitos fotónicos para redes ópticas de próxima generación** *(completed).* PI (Quside). CDTI. Exp. MIG-20241133. €1.75M. 01/2025–12/2025.

PhD Thesis Supervision

- **Optimization with spin glass models** — David Cirauqui García. UPC/ICFO. Defended September 2024, Sobresaliente. Co-supervised with Prof. Maciej Lewenstein.
- **Geometric Deep Learning in the Quantum Sciences** — Timothy Heightman. ICFO. In progress. Co-supervised with Prof. Antonio Acín.

Teaching

- **Software Architecture for Quantum Computers** — UPC Postgraduate Course in Quantum Engineering (2021–Present). 3h/year.
- **PQC & QRNG Seminars** — Master of Quantum Science and Technology, Università di Bari (July 2025). 6h total.
- **QRNG for Cybersecurity and Blockchain** — QSecDef certified training course. Co-authored with D. Worrall (January 2026). 4–5h.

Master's Thesis Supervision

Year	Student	Title
2023	Héctor Briongos Merino	QRNG for Physics-Inspired Problems in Finance
2022	Jaume Villasante Cánovas	Quantum random numbers for physics-inspired optimization problems
2021	Sergio López Casablanca	Design, implementation and validation of probability distributions generators in FPGA
2020	Alba Torras Coloma	Computational chemistry algorithms based on Gaussian basis sets for quantum computers

Mentoring

- **Industry Mentor** — Proyecto Aplicado de Ingeniería (PAE), UPC–ETSETB (2025)
- **Mentor** — Tech2X, ESADE / EIT Higher Education Initiative (2025)

Conferences and Seminars

- **QRNG for Cybersecurity and Blockchain** — QSecDef (January 2026)
- **"Desde la cuántica hasta la nube..."** — Invited seminar, UCM (September 2025)
- **"Desde la cuántica hasta la nube..."** — Invited seminar, UCM (October 2024)
- **Quantum Random Number Generation** — OCP Global Summit, San Jose, CA (October 2024)
- **Seminario Akademia** — Akademia, Fundación Innovación Bankinter (April 2024)
- **"De la Complu a la start-up: mis tres cisnes negros"** — UCM, Día Internacional de la Luz (2021)
- **Analytical modeling of graphene plasmons** — SPIE Active Photonic Platforms X, San Diego (2018)
- **Graphene-plasmon lenses for enhanced harmonic generation** — SPIE Optics+Photonics, San Diego (2017)
- **Complete optical absorption of ultrashort pulses by plasmons in nanostructured graphene** — SPIE Nanoscience + Engineering, San Diego (2016)
- **Probing Nanographene Phonons with EELS** — SPP7, Jerusalem (2015, Poster)
- **Effect of Electron-Phonon Coupling on the Plasmon Lifetimes in Nanographene** — SPP7, Jerusalem (2015, Poster)

Research Stays

Palo Alto Research Center (PARC) — Xerox | Research Intern | May–August 2017
Radar technologies, environmental sensors, optical filters, antenna design, and energy harvesting. Resulting in joint publications and patents.

Grants and Awards

- **Torres Quevedo 2018** — Postdoctoral contract. Agencia Estatal de Investigación. Ref: PTQ2018-010146.
- **FI-DGR 2015** — Predoctoral fellowship. AGAUR, Generalitat de Catalunya. Ref: 2015 FI_B 00492.

Languages

- **Spanish:** Native
- **English:** B2 certified (UOC, 2024)

Science Outreach

Author of chapters in popular science books:

- *Ciencia, y además lo entiendo* — Chapters 62 & 63
- *Ciencia, y yo quiero ser científico* — Chapter 70
- *Ciencia y otras easy pieces* — Chapter 37

Personal Projects

- **El Fotonario** — Interactive photonics education platform in Spanish. 9 courses, 145 exercises, 78 visualizations. joseramasa.github.io/fotonica
- **Con la Venia** — Interactive visual novel for learning Spanish civil procedural law. Built with Ren'Py. joseramasa.github.io/con-la-venia

---

Interests

- **Quantum Technologies:** Random number generation, Post-quantum cryptography, Quantum computing
- **Intellectual Property & Law:** Patent prosecution, Technology regulation
- **University Service:** Member of the Faculty Board, Facultad de Ciencias Físicas, UCM (2011–2012)