# Diogo Cruz

*Curriculum Vitae*

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## Education

**2014-2019** **Integrated Master Degree (MSc) in Engineering Physics (MEFT)**, *Instituto Superior Técnico*, Lisboa.
  ○ Received **Academic Excellence Diploma** in 2014/2015 and 2015/2016;
  ○ Received **Academic Merit Diploma** in 2016/2017 and 2018/2019;
  ○ Received **1st Honorable Mention of "Academic Excellence in MEFT"** 2016/2017 - one of the top students in the course;
  Bachelor's and Master's degree average grade of 18.4 and 18.1 out of 20, respectively.

**2018** **Erasmus (2nd semester) at École Polytechnique Fédérale de Lausanne (EPFL)**, Switzerland.

**2019-2020** **Graduate Research Assistant**, *Instituto de Telecomunicações*, Portugal.

**2020-2024** **PhD Student**, *Instituto Superior Técnico*, Portugal.
  Developing quantum algorithms to solve nonlinear partial differential equations; quantum error correction; and studying many-body systems using near-future quantum devices.

**2024** **Visiting Student**, *MIT*, USA.

**various** **Machine Learning and AI Safety online courses and programs**.
  *Learning From Data* from Caltech; *Stanford CS231n: Convolutional Neural Networks for Visual Recognition*; *AI Safety Fundamentals*, by BlueDot Impact; *MLSS and AISES Programs*, by CAIS; *AI Safety Hub Labs*; Pivotal Research Fellowship.

## Teaching

**2017-2018** **Electromagnetism and Optics**, *Aerospace, Naval Engineering*, IST.

**2022-2023** **Techniques of Mathematical Physics**, *Physics Engineering*, IST.

**2022-2023** **Quantum Mechanics**, *Aerospace, Naval, Mechanical Engineering*, IST.

**2024** **AI Safety Fundamentals: Alignment course**, *Facilitator*, Bluedot Impact.

**2024** **AI Safety, Ethics, and Society**, *Facilitator*, CAIS.

## Selected Publications

**See *Google Scholar* for more**.

**2023** **Reinforcement Learning Fine-tuning of Language Models is Biased Towards More Extractable Features**, *Cruz, D. et al*, arXiv: 2311.04046, 2023.

**2023** **Understanding the learned look-ahead behavior of chess neural networks**, *Cruz, D.*, under review (click title for draft link), 2024.

**2019** **Efficient quantum algorithms for GHZ and W states, and implementation on the IBM quantum computer**, *Cruz, D. et al*, Advanced Quantum Technologies 0 (0), 1900015, 2019.

**2023** **Quantum Error Correction via Noise Guessing Decoding**, *Cruz, D.; Monteiro, F. A.; Coutinho, B. C.*, IEEE Access, vol. 11, pp. 119446-119461, 2023.

**2023** **Superresolution of Green's functions on noisy quantum computers**, *Cruz, D.; Magano, D.*, Phys. Rev. A 108, 012618, 2023.

**2023** **A Living Review of Quantum Computing for Plasma Physics**, *Amaro, O.; Cruz, D.*, arXiv: 2302.00001, 2023.

## Awards

**2013-2014** **Physics Olympiad**.
- **1st place** in central Portugal regional level;
- **Honorable Mention (Top 10)** at the national level;
- **Honorable Mention** in the XLV IPhO in 2014, in Kazakhstan (international).

**2013-2014** **Astronomy Olympiad**.
- **1st place** at the national level;
- **Honorable Mention** in the IOAA in 2014 (international) - best result ever for Portugal.

**2018** **2nd place for "IBM Q Best Paper Award"**.
Award associated with paper DOI: 10.1002/qute.201900015.

**2019** **Grant from Gulbenkian Program "New Talents in Quantum Technologies"**.

**2021** **Winner of iQuHACK 2021**, *MIT*, United States.
Part of winning team in the D-Wave Challenge of *interdisciplinary Quantum HACKathon* 2021.

**2022** **Winner of QCHACK 2022**, *Stanford*, United States.
Part of winning team in the QuTech Challenge of *QC Hack* 2022.

**2022** **1st Prize in Classiq Coding Competition's Hamiltonian Exponentiation Challenge**.

## Schools, Internships, and Hackathons

**2015** **London International Youth Science Fair (LIYSF)**.

**2016** **Hands on Quantum Mechanics (HonQM)**, *IST*.

**2016** **8th School of Astrophysics and Gravitation**, *IST*, CENTRA.

**2016** **ATLAS Internship**, *FCUL (University of Lisbon) and LIP*.

**2017** **IV Journey of Physics Engineering**, *IST*.

**2017** **2nd Mini-school of Particle Physics and Astrophysics in Lisbon**, *IST*, Sesimbra.

**2017** **GoLP Internship**, *IST*.

**2018-2019** **Quantum Computing Task Force**, *Instituto de Telecomunicações, IST*.

**2021, 2022, 2023, 2024** **Interdisciplinary Quantum HACKathon (iQuHack)**, *MIT*.

**2021, 2022** **QC Hack**, *Stanford, Yale, Duke, and Berkeley*.

**2021** **Qiskit Hackathon Europe**, *IBM*.

**2021-2022** **IBM Quantum's Open Science Prize**, *IBM*.

**2023, 2024** **AI Safety Fundamentals: Alignment and Governance course**, *BlueDot Impact*.

**2023** **AI Safety Hub Labs**, *Oxford*.

**2023** **ML Safety Scholar Programs**, *CAIS*.

**2024** **AI Safety, Ethics, and Society**, *CAIS*.

**2024** **Pivotal Research Fellowship**, *Pivotal*.

**2024** **Research Engineers Club**, *Safe AI London*.

## Volunteering

**2017** **Member of the local organizing commitee in Extremely High-Intensity Laser Physics (ExHILP) 2017 conference**, *IST*.

**2018** **"Superguide" (Liaison Officer) of IPhO 2018**, Portugal.
Responsible for 9 guides and 38 international students, and for organizing part of the guides' and students' activities at IPhO.

**2019** **Quantum Internet Alliance workshop**, Portugal.