

PERSONAL INFORMATION **Andrea Cacioppo**✉ andrea.cacioppo@uniroma1.it

EDUCATION AND TRAINING

Nov 2022 – Present **Ph.D. in Physics**

Sapienza Università di Roma, Italy

Topics: Generative algorithms for quantum computers; physics-guided algorithms for graph coloring*Group:* Fisica AI&QC group (<https://sites.google.com/a/uniroma1.it/stefanogiagu/fisicaAI>)*Supervisors:* Stefano Giagu (<https://stefanogiagu.site.uniroma1.it/home>), Fabio Sciarino (<https://www.quantumlab.it/principal-investigator>)Nov 2020 – Nov 2021 (interrupted) **Ph.D. in Computer Engineering**

Technical University of Munich, Germany

Topics: Classical-quantum compound channels; automatic generation of quantum graph states in photonic qubits*Group:* Theoretical Quantum System Design group (<https://www.ce.cit.tum.de/en/lti/tqsd/>)*Supervisors:* Janis Nötzel (<https://www.professoren.tum.de/en/tum-junior-fellows/n/noetzel-janis>), Jonathan Finley (<https://www.professoren.tum.de/en/finley-jonathan>)Oct 2016 – May 2020 **M.Sc. in Physics**

Sapienza Università di Roma, Italy

Thesis: “Deep Learning for the Parameter Estimation of Tight-Binding Hamiltonians”*Supervisors:* Stefano Giagu (<https://stefanogiagu.site.uniroma1.it/home>), Stefan Bauer (<https://cifar.ca/bios/stefan-bauer/>)*Grade:* 109/110Sep 2013 – Oct 2016 **B.Sc. in Physics**

Sapienza Università di Roma, Italy

Thesis: “Hidden Markov Model”*Supervisor:* Luciano Pietronero (<http://www.lucianopietronero.it/>)*Grade:* 110/110 with honors

WORK EXPERIENCE

Jan 2022 – July 2025 **ML Consultant**

Freelance, Italy

Topics: Deep learning to solve PDEs (including finance applications); implementation of diffusion models; training neural networks on incomplete datasets; modeling complex physical systems; invoice reconciliation using an online LLMNov 2024 – Mar 2025 **ML Consultant**Grid +, Rome, Italy (<https://www.gridplus.it>)*Topics:* Automatic analysis of legal documents and anomaly detection

Sep 2023 – Nov 2023 ML Consultant

Hypercube SA, Lugano, Switzerland (<https://www.hypercube.eco/>)

Tasks: Time series anomaly detection and feasibility assessment of AI projects

Dec 2022 – Aug 2023 ML Consultant

Primis Group SRL, Milan, Italy (<https://www.primisgroup.com/>)

Tasks: Determined best AI solutions tailored to LiDAR and satellite data; designed an anomaly detection algorithm for LiDAR data (contract with *Rete Ferroviaria Italiana SPA* (<https://www.rfi.it/>))

Jan 2022 – Nov 2024 Tutor

Freelance, Italy

Topics: Mathematics, physics and computer science lessons for university students

Nov 2020 – Nov 2021 Tutor

Technical University of Munich, Germany

Task: Assisting students of the “Quantum Networking” class

Sep 2019 – Oct 2020 Research Internship

Max Planck Institute for Intelligent Systems, Tübingen, Germany

Topics: Deep learning for estimating tight-binding Hamiltonians; quantum machine learning models and kernel methods

AWARDS AND GRANTS**Nov 2024 – Nov 2023 Research Grant**

Sapienza Università di Roma, Rome, Italy

“Development of quantum machine learning algorithms” - €1,000

Oct 2016 Excellence Program for Honour Students

Sapienza Università di Roma, Rome, Italy

ACADEMIC CONTRIBUTIONS**October 2024 Talk**

Quantum Computing @ INFN 2024, Padova, Italy (<https://agenda.infn.it/event/42801/>)

“Quantum Diffusion Models for Quantum Data Learning”

October 2024 Talk

38° Cycle PhD Seminar, Rome, Italy (<https://www.phys.uniroma1.it/fisica/en/archivionotizie/38-cycle-phd-physics>)

“Quantum Machine Learning and Physics-Informed Deep Learning Algorithms”

April 2024 Flash Talk

EuCAIFCon 2024, Amsterdam, Netherlands (<https://indico.nikhef.nl/event/4875/>)

“Parameterized Quantum Circuits for Anomaly Detection and Generative Tasks”

February 2024 Reviewer

Communication Physics, Nature Publishing Group

- November 2023 **Poster Presentation**
 QTML2023 Conference, Geneva, Switzerland (<https://qtml-2023.web.cern.ch/>)
 “Parameterized Quantum Circuits for Anomaly Detection and Generative Tasks”
- November 2023 **Talk**
 QAIxIAQ2023 Workshop, Rome, Italy (<https://aiqxqia2023.cnr.it/>)
 “Quantum Diffusion Models Using Parameterized Quantum Circuits for Data Denoising”
- October 2023 **Poster Presentation**
 Quantum Computing and Simulation Workshop 2023, Venice, Italy (<https://indico.dfa.unipd.it/event/818/>)
 “Parameterized Quantum Circuits for Anomaly Detection and Generative Tasks”
- July 2021 **Talk**
 ISIT 2021 IEEE International Symposium on Information Theory
 “Compound Channel Capacities Under Energy Constraints and Application”
- March 2021 **Organizer**
 EACN 2021: Entanglement Assisted Communication Network (<https://www.mcqst.de/news-and-events/eacn-2021/>)
- February 2021 **Poster Presentation**
 BeyondC: Quantum Information Systems Beyond Classical Capabilities (<https://www.beyondc.at/events/sfb-beyondc-winter-workshop-2021/>)
 “Quantum Receiver Design”
- June 2020 **Poster Presentation**
 BiGmax: Big Data Driven Material Science (<https://www.mpie.de/4171441/bigmax-workshop-2020-on-big-data-driven-materials-science>)
 “Deep Learning for the Parameter Estimation of Tight-Binding Hamiltonians”

PERSONAL SKILLS

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
German	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](#)

- Digital Skills
- **Advanced:** Python, PyTorch
 - **Good:** TensorFlow, GitHub, Linux, \LaTeX
 - **Basic:** C, HTML

PUBLICATIONS

Publications

- [1] Andrea Cacioppo. “Deep learning for the parameter estimation of tight-binding Hamiltonians”. PhD thesis. Sapienza Università di Roma Rom, 2020.
- [2] Andrea Cacioppo, Janis Nötzel, and Matteo Rosati. “Compound channel capacities under energy constraints and application”. In: *2021 IEEE International Symposium on Information Theory (ISIT)*. IEEE. 2021, pp. 640–645.
- [3] Andrea Cacioppo et al. “Quantum diffusion models”. In: *arXiv preprint arXiv:2311.15444* (2023).
- [4] Lorenzo Colantonio et al. “Efficient Graph Coloring with Neural Networks: A Physics-Inspired Approach for Large Graphs”. In: *arXiv preprint arXiv:2408.01503* (2024).