

RESEARCHER IDENTITY	<p><i>Nome</i> Andrea</p> <p><i>Cognome</i> Mari</p> <p><i>Web page</i> sites.google.com/site/andreamari84/</p> <p><i>ORCID</i> 0000-0002-5785-3093</p> <p><i>ScopusID</i> 24832078800</p> <p><i>ResearcherID</i> I-5535-2012</p>
PROFESSIONAL AND ACADEMIC POSITIONS	<p>2020-2021, Member of Technical Staff, Unitary Fund, San Francisco, USA. When: from 6/1/2020 to now. Topic: Error mitigation of near-term quantum computers. Activity: scientific research and quantum software.</p> <p>2019-2020, Researcher, Xanadu Quantum Technologies Inc., Toronto, Canada. When: from 1/1/2019 to 31/12/2019. Topic: machine learning with NISQ devices. Activity: scientific research and quantum software.</p> <p>2017-2018, Post-doc, Scuola Normale Superiore, Pisa, Italy. When: from 2/1/2017 to 31/06/2018. Topic: quantum information and quantum optics.</p> <p>2014-2016, Post-doc, National Research Council (CNR-Nano), Pisa, Italy. When: from 1/08/2014 to 31/12/2016. Topic: quantum information and opto-mechanics.</p> <p>2012-2014, Post-doc, Scuola Normale Superiore, Pisa, Italy. When: from 2/05/2012 to 30/04/2014. Topic: quantum information and quantum optics.</p>
EDUCATION AND TITLES	<p>07/01/2020, National Scientific Habilitation as Associate Professor in Theoretical Physics [02/A2, FIS/02].</p> <p>10/04/2017, National Scientific Habilitation as Associate Professor in Theoretical Matter Physics [02/B2, FIS/03].</p> <p>06/06/2012, PhD in Physics, University of Potsdam, Germany, Final mark: <i>Summa cum laude</i>, Supervisor: Prof. Jens Eisert.</p> <p>30/10/2008, Master's degree in Physics, University of Camerino, Italy. Final mark: 110/110 cum laude.</p>
TEACHING AND MENTORING EXPERIENCE	<p>2016-2017, Teaching assistant, <i>Quantum Mechanics</i>, Scuola Normale Superiore, Pisa.</p> <p>2015-2016, Teaching assistant, <i>Quantum Mechanics</i>, Scuola Normale Superiore, Pisa.</p> <p>2014-2015, Teaching assistant, <i>Quantum Mechanics</i>, Scuola Normale Superiore, Pisa.</p> <p>2012-2013, Teaching assistant, <i>Statistical Physics</i>, Scuola Normale Superiore, Pisa.</p> <p>2014-2015, Co-supervisor of Vasco Cavina, Master's in Physics, SNS, Pisa, Italy.</p> <p>2015-2017, Co-supervisor of Matteo Rosati, PhD in Physics, SNS, Pisa, Italy.</p> <p>2013-2019, Tutor of 6 PhD students: Vasco Cavina, Giacomo De Palma, Stefano Cusumano, Alessandro Farace, Donato Farina and Marcello Andolina.</p> <p>12/09/2016, Participation as external referee to the PhD defense of Giacomo De Palma, Scuola Normale Superiore, Pisa.</p>
AWARDS AND GRANTS	<p>2018, <i>Giuseppe Davide Paparo Prize</i>, for “relevant contribution in Quantum Technologies”, assigned by University of Catania in collaboration with the “Giuseppe Davide Paparo” association.</p> <p>2013, P.I. of the research grant <i>Progetto Giovani Ricercatori 2013</i>,</p>

Title: “Spontaneous synchronization and entanglement”,
 Funded by: Scuola Normale Superiore, Pisa.
 2009, *Angelo Battelli Prize*, for young researchers, assigned by the Italian Physical society.

INVITED TALKS

Feb. 2022, Invited talk, QHack 2022, Xanadu, Remote.
 Dec. 2021, Invited talk, Qiskit Seminars, IBM Quantum, Remote.
 Sept. 2020, Invited talk, Quantum Conversations By The Bay, <https://quantum.sv/>. Remote.
 Sept. 2017, Invited talk, Workshop on Q. Science and Q. Technologies, ICTP, Trieste, Italy.
 Sept. 2016, Invited talk, Testing the limits of quantum superpositions, ECT, Trento, Italy.
 Jan. 2016, *Colloquium*, IQST, University of Ulm, Ulm, Germany.
 Jan. 2016, Special Seminar, Max Planck Institute of Quantum Optics, Munich, Germany.
 Jan. 2015, *Plenary speaker*, Quantum Information Processing 2015, Sydney, Australia.
 Feb. 2014, Invited seminar, Physics Division, University of Camerino, Italy.
 Gen. 2014, Invited talk, Frontiers of Opto- and Electro- Mechanical Systems, Trento, Italy.
 May 2011, Group seminar, QUINFO, University College London, UK.
 Oct. 2010, Invited talk, Foundations and Open Systems II, University of Turku, Finland.

OTHER TALKS AND POSTERS

June 2021, Talk, Programming Languages and Quantum Computing (PLanQC). Remote.
 March 2021, Talk, APS March Meeting. Remote.
 Dec. 2019, Talk, Quantum Computing and HPC 2nd Edition, CINECA, Italy, 2019. Sept.
 2017, Talk, Italian Q. Information Science 2017, University of Florence, Florence, Italy.
 June 2017, Poster, Gravitational Decoherence, Bad Honnef, Germany. [**best poster prize**]
 Mar. 2017, Talk, 5th Quantum Thermodynamics Conference, Oxford, UK. [**best talk prize**]
 Feb. 2016, Talk, QO-QI group, University of Camerino, Italy.
 Sept. 2014, Talk, SIF National Congress, Pisa, Italy.
 Oct. 2013, Talk, Italian Q. Information Science 2013, Como, Italy.
 Oct. 2013, Poster, NIQ-QS, Ettore Majorana Centre, Erice, Italy
 June 2013, Poster, QIPC2013, Florence, Italy.
 June 2013, Talk, Central European Workshop on Quantum Optics, Stockholm, Sweden.
 June 2011, Workshop, Quantum Information, Benasque, Spain.
 Mar. 2011, Talk, DPG spring meeting, Dresden, Germany.
 Mar. 2010, Poster, Gordon Conference (optomechanics), Galvestone, Texas, USA.
 Mar. 2010, Talk, DPG spring meeting, Hannover, Germany.
 May 2010, Talk, Extended A2 Workshop, Reims, Germany.
 Oct. 2009, Talk, QQQ meeting, Freie Universität, Berlin, Germany.
 Sept. 2009, Talk, SIF National Congress, Bari, Italy.

RESEARCH INTERESTS

My research experience is mainly in the fields of *open quantum systems* and *quantum information*. More specific topics of my research activity are: *photonic quantum communication*, *quantum thermodynamics*, *quantum synchronization*, *quantum foundations*. More recent research interests are also *near-term quantum computing* and *quantum error mitigation*.

TRACK RECORD

Short summary of my main scientific results.

- During my PhD, I developed the first theoretical proposal of a quantum thermodynamic refrigerator based on opto-mechanical systems [PRL 2012].
- In the same year, I proved that quantum states with negative Wigner functions are necessary for a quantum computing speedup [PRL 2012].
- As a post-doc, I introduced a quantitative measure of spontaneous synchronization for continuous-variable quantum systems [PRL 2013].
- In 2014, in collaboration with Giovannetti and Holevo, I contributed to the solution of a longstanding open problem related to quantum Gaussian channels: the output majorization conjecture [Nature Comm. 2014].

- In 2015, I designed theoretical prototype of a nano-mechanical “piston engine”, capable of transforming heat into coherent vibrations [JPB 2015].
- In 2016, through a thought experiment involving gravity, quantum mechanics and causality, I have shown the existence of a minimum fundamental time necessary for experimentally testing any quantum superposition of macroscopic masses [Sci. Rep. 2016].
- In 2019, as a researcher at Xanadu, I developed a theory of *quantum transfer learning* suitable for hybrid quantum and classical systems. With this method, for the first time, high-resolution images have been classified with real quantum processors (IBM and Rigetti). [Quantum 2019]
- Since 2020, I am a core developer of Mitiq, an open source software library for error mitigation on near-term quantum computers [<https://github.com/unitaryfund/mitiq>].

PUBLICATIONS OVERVIEW

I am co-author of 50 publications in peer-reviewed journals, including: Nature Photonics (1), Nature Communications (2) and Physical Review Letters (10).
 Google Scholar profile: <https://scholar.google.it/citations?user=T7KlX-wAAAAJ>
 ORCID: 0000-0002-5785-3093
 Thomson Reuters, ResearcherID: I-5535-2012
 ScopusID: 24832078800
 The list of all my publications can also be found at this web page:
<https://sites.google.com/site/andreamari84/publications>

REFEREE ACTIVITY

2020-now, Voting member of the review board for the Micro-grants Program for Quantum Technologies, Unitary Fund, San Francisco, USA.

2009-now, referee for the following journals:

Nature Communications, PRX, PRX Quantum, Physical Review Letters, Physical Review A/B/E, New Journal of Physics, Journal of Physics A and B, Physica Scripta, Journal of Mathematical Physics, IEEE Transactions on Information Theory, EPJ plus, Scientific Reports, Quantum Science and Technology (IOP), Entropy, QIP Conference.