

Matteo Pompili

EXPERIMENTAL QUANTUM PHYSICIST · RESEARCH SOFTWARE DEVELOPER

matpompili | matteopompili | matpompili.github.io

Education

Ph.D. cum laude in Quantum Technologies

Delft, The Netherlands

QuTech - Delft University of Technology

Nov. 2017 - Dec. 2021

- Under the supervision of Prof. Ronald Hanson, I realized the world's first multi-node quantum network, and demonstrated the delivery of entanglement using a platform-independent quantum network stack, using single spins in diamond as qubits.
- I was one of the 15 Early Stage Researchers in the Spin-NANO European Innovative Training Network funded by the Marie Skłodowska-Curie Actions.
- I supervised MSc and BSc students in their final projects in the Hanson group.

M.Sc. cum laude in Condensed Matter Physics

Rome, Italy

La Sapienza - Università di Roma

Sep. 2015 - Oct. 2017

- I graduated cum laude with a thesis titled "Benchmarking photonic integrated circuits", supervised by Prof. Fabio Sciarrino.

B.Sc. cum laude in Physics

Rome, Italy

La Sapienza - Università di Roma

Sep. 2012 - Sep. 2015

- I graduated cum laude with a thesis titled "Integrated optical devices for quantum information", supervised by Prof. Paolo Mataloni.
- I was awarded a scholarship called "Percorso d'Eccellenza" (Pathway to Excellence), which gave me the opportunity to follow additional courses on specific topics, such as computational physics and electronics. There I learned how to use Arduino for scientific applications and C++.

Skills & Interests

Experimental Optics, Electronics, Cryogenics, Vacuum

Programming Strong knowledge of Python, solid in C and C++;
Experience in JS, VHDL, Mathematica, PHP, HTML/CSS, MySQL and LabVIEW

Languages Italian, mother tongue; English, AEPA Excellent

Communication Knowledge of LaTeX and PowerPoint.
Strong expertise with Blender 3D; my freely available models have been downloaded over 5000 times

Hobbies I have been playing electric and acoustic guitar for more than ten years.
I like going on long bike rides and RV traveling.

Experience

Pritzker School of Molecular Engineering - University of Chicago

Chicago, IL, USA

POSTDOCTORAL RESEARCHER

Mar. 2022 - Present

In the group of Prof. Hannes Bernien I am developing a quantum network node that operates at telecom wavelength based on neutral atoms and nanophotonic cavities.

QuTech - Delft University of Technology

Delft, The Netherlands

POSTDOCTORAL RESEARCHER

Dec. 2021 - Feb. 2022

In the group of Prof. Ronald Hanson I improved the capabilities of the physical layer of our quantum network stack to control multiple qubits, as well as upgraded one of the NV center quantum network nodes for future experiments. Additionally, I led initial efforts for collaborations with quantum start-ups for custom hardware and software development.

Department of Physics - University of Rome La Sapienza

Rome, Italy

SENIOR LABORATORY TUTOR

Mar. 2017 - June 2017

I worked 40 hours as a scholarship recipient helping students in the course "Laboratory of Mechanics".

LIBRARIAN

Jan. 2015 - Jan. 2017

I worked as a librarian for 150 hours a year as a scholarship recipient, personally managing the services offered by the library.

SECLAN S.r.l

Rome, Italy

WEB DEVELOPER AND DESIGNER

Sep. 2013 - Nov. 2015

I designed and developed a new website for SECLAN, a company which sells office furniture in Rome.

Activities

CRI - Italian Red Cross

VOLUNTEER

Italy

Sep. 2016 - Nov. 2017

- I was a volunteer at the "Roma 9 Local Committee", where I attended Basic Life Support and Pediatric Basic Life Support courses.
- I was part of the SASFID team, providing support, both social and medical, to homeless people in the southern part of Rome.

RAYS - Rome Association of Young Scientist

MEMBER

Italy

Dec. 2015 - Nov. 2017

- Outreach activities for the non-scientist audience in Rome.
- We took part in the Maker Faire Rome 2016, where we conducted simple optics experiments for the attendees.

Publications

2022

- Entangling remote qubits using the single-photon protocol: an in-depth theoretical and experimental study, *Sophie LN Hermans, Matteo Pompili, Laura dos Santos Martins, Alejandro R-P Montblanch, Hans KC Beukers, Simon Baier, Johannes Borregaard & Ronald Hanson*, arXiv preprint arXiv:2208.07449.
- Qubit teleportation between non-neighboring nodes in a quantum network, *Sophie LN Hermans*, Matteo Pompili*, Hans KC Beukers, Simon Baier, Johannes Borregaard & Ronald Hanson*, **Nature** 605, 663-668.

2021

- Multi-Node Quantum Networks with Diamond Qubits, Matteo Pompili, PhD Thesis, Delft University of Technology. ISBN 978-90-8593-497-4. <https://doi.org/10.4233/uuid:b125ec2d-e2af-4708-bccc-0a2357a533b1>
- Experimental demonstration of entanglement delivery using a quantum network stack, *Matteo Pompili*, Carlo Delle Donne*, Ingmar te Raa, Bart van der Vecht, Matthew Skrzypczyk, Guilherme Ferreira, Lisa de Kluijver, Arian J Stolk, Sophie LN Hermans, Przemysław Pawełczak, Wojciech Kozłowski & Ronald Hanson, Stephanie Wehner*, arXiv preprint arXiv:2111.11332.
- Realization of a multinode quantum network of remote solid-state qubits, *Matteo Pompili*, Sophie LN Hermans*, Simon Baier*, Hans KC Beukers, Peter C Humphreys, Raymond N Schouten, Raymond FL Vermeulen, Marijn J Tiggelman, Laura dos Santos Martins, Bas Dirkse, Stephanie Wehner & Ronald Hanson*, **Science** 372 259-264.

2020

- Witnessing entanglement in experiments with correlated noise, *Bas Dirkse, Matteo Pompili, Ronald Hanson, Michael Walter & Stephanie Wehner*, **Quantum Sci. Technol.** 5 035007.

2019

- A link layer protocol for quantum networks, *Axel Dahlberg, Matthew Skrzypczyk, Tim Coopmans, Leon Wubben, Filip Rozpędek, Matteo Pompili, Arian Stolk, Przemysław Pawełczak, Robert Knegjens, Julio de Oliveira Filho, Ronald Hanson & Stephanie Wehner*, In Proceedings of the ACM Special Interest Group on Data Communication (**SIGCOMM '19**). Association for Computing Machinery, New York, NY, USA, 159–173.

2018

- Experimental statistical signature of many-body quantum interference, *Taira Giordani, Fulvio Flamini, Matteo Pompili, Niko Viggianiello, Nicolò Spagnolo, Andrea Crespi, Roberto Osellame, Nathan Wiebe, Mattia Walschaers, Andreas Buchleitner & Fabio Sciarrino*, **Nature Photonics** 12 (3), 173