Mattia Beccaceci

Curriculum Vitae

Education and Training

2023 - Current **PhD in Material Science**, *Sapienza University of Rome*, Rome
PhD student at the Physics Department under the supervision of Prof. Rinaldo Trotta. Currently investigating resonance fluorescence techniques to increase the indistinguishability of single photons emitted by semiconductor quantum dots in photonic cavities based on circular Bragg reflectors.

May - Sept 2023 **Scholarship**, *Sapienza University of Rome*, Rome
5 months scholarship at Nanophotonics Lab.
Title: "Realization of a quantum cryptography experiment with entangled photons generated by quantum dots"
Funder: QUROPE
Scient. Manager: Prof. Rinaldo Trotta

2020 - 2022 **Master degree in Physics**, *Sapienza University of Rome*, Rome, *Cum Laude* Thesis title: Entangled Photon Pairs from Strain-tuneable Semiconductor Quantum Dots in a Bullseye Cavity. Activity performed at Nanophotonics Lab under the supervision of Prof. Rinaldo Trotta.

2017 - 2020 **Bachelor degree in Physics**, *Sapienza University of Rome*, Rome
Thesis title: Noise and Disturbances in Electronic Systems. Manuscript realized under the supervision of Prof. Franco Meddi.

2012 - 2017 **High School Diploma**, *Liceo Scientifico Albert Einstein*, Teramo (TE)

Technical Skills

Wide experience in experimental techniques of semiconductor physics and quantum optics acquired during the Master thesis and scholarships activities:

- High level of experience in advanced optical characterization techniques (time- and polarization-resolved micro-photoluminescence, Michelson interferometry, temporal correlation of optical signals, indistinguishability measurements, quantum state tomography).
- Good level of experience in high-vacuum and cryogenic technologies.

Laboratory experience in other solid-state physics experimental techniques acquired during the Master's degree:

- Optical characterization (VIS and IR absorption)
- Vibrational characterization (Resonant and off-resonant Raman spectroscopy, Pump and probe Raman spectroscopy).

Proficiency in the theoretical and practical tools required for the analysis and interpretation of experimental data.

Refined skills of research, critical selection, and synthesis of scientific and technical literature.

Organizational Skills

Key skills developed during the Master's thesis and scholarship periods:

- Marked problem-solving skills;
- Ability to independently carry out work activities.
- Excellent inclination towards teamwork, both with in a research group and in external collaborations.
- Aptitude towards quickly learning new technical knowledge and competences aimed at the solution of practical problems.
- Excellent oral exposition and capacity in writing (both Italian and English).

Digital Skills

Operating System , Windows, Linux

Programming Lenguages , C, La TeX, MatLab

Programs , Microsoft Office Suite, Origin, MatLab, Mathematica

Language Skills

Italian , Mothertoungue

English , Excellent , fluent in conversation and writing French
, Basic, only basic words and expressions

Publications and Preprints

[1] , F. Basso Basset, M. B. Rota, M. Beccaceci, T. M. Krieger, Q. Buchinger, J. Neuwirth, H. Huet, S. Stroj, S. F. Covre da Silva, G. Ronco, C. Schimpf, S. Höfling, T. Huber-Loyola, A. Rastelli, and R. Trotta, "Signatures of the Optical Stark Effect on Entangled Photon Pairs from Resonantly-Pumped Quantum Dots", Phys. Rev. Lett. **131**, 166901 (2023)

[2] , M. B. Rota, T. M. Krieger, Q. Buchinger, M. Beccaceci, J.Neuwirth, H. Huet, N. Horová, G. Lovicu, G. Ronco, S. F. Covre da Silva, G. Pettinari, M. Mocza la-Dusanowska, C. Kohlberger, S. Manna, S. Stroj, J. Freund, X. Yuan, C. Schneider, M. Ježek, S. Höfling, F. Basso Basset, T. Huber- Loyola, A. Rastelli, R. Trotta, "A source of entangled photons based on a cavity-enhanced and strain-tuned GaAs quantum dot", arXiv:2212.12506 (2022)

[3] , G. Peniakov, Q. Buchinger, M. Helal, S. Betzold, Y. Reum, M. B. Rota, G. Ronco, M. Beccaceci, T. M. Krieger, S. F. Covre Da Silva, A. Rastelli, R. Trotta, A. Pfenning, S. Hoefling, T. Huber-Loyola, "Polarized and Un-Polarized Emission from a Single Emitter in a Bullseye Resonator", arXiv:2308.06231v1 (2022)

Conferences

Posters

12/2023 **EQEP 2023**, 9th international workshop on Engineering of Quantum Emitter Properties at the University of Paderborn (Paderborn, Germany)

09/2023 **QUROPE 2023**, 1st international workshop on Quantum Repeaters using On-demand Photonic Entanglement at the University of Sapienza (Rome, Italy)

Outreach

05/2023 , Guide for lab tours as part of the White Night of Rome museums at the Sapienza University of Rome (Rome).

04/2023 , Guide for the exhibits “Dire l’indicibile: l’entanglement quantistico” (2023) as part of the Italian Quantum Weeks at the Classical Art Museum, Sapienza University of Rome (Rome).

Autorizzo il **trattamento** dei miei **dati personali** ai sensi del Decreto Legislativo 196/2003, coordinato con il Decreto Legislativo 101/2018, e dell'art. 13 del GDPR (Regolamento UE 2016/679) ai fini della pubblicazione in Amministrazione Trasparente - Sapienza come da normativa vigente.