

Lorenzo Leone

CONTACT INFORMATION	Corso Vittorio Emanuele 539, Napoli 80135, Italy Tel: (Italy) +39 3888788726, (USA) +1 857 334 2821 Email: lorenzo.leone001@umb.edu
CITIZENSHIP	Italy
WHO AM I	I am a Ph.D. student whose main interest is Quantum Information Theory, a broad field able to touch many topics in quantum physics. My research activity involves topics such as Quantum Chaos and quantum complexity. One of my main interests is understanding the different features of Quantum Chaos and the development of a complete characterization of quantum complexity.
RESEARCH INTERESTS	Topics of research I have been particularly interested in are the theory of quantum chaos and quantum complexity, magic of quantum states, theory of entanglement, quantum information in open systems, theory of topological order, theory of quantum integrability, quantum resource theory and coherence in quantum evolutions.
EDUCATION	Umass Boston Ph.D., Applied Physics, Ongoing (Expected graduation date: May 2023) <ul style="list-style-type: none">• Written Qualifiers: <i>Passed</i>• Oral Qualifier: <i>Passed</i> University of Napoli Federico II , Naples, Italy M.S., Theoretical Physics, July 2019 <ul style="list-style-type: none">• Thesis Title: <i>Sinergy between the Heat kernel and the parity anomaly</i>• Advisors: Professor Fedele Lizzi Professor Maxim Kurkov• Final Mark: 110/110 cum laude
TEACHING EXPERIENCE	Fall 2019 - Fall 2020 Teaching Assistantship, Umass Boston February 2015 - May 2018 Math and Physics tutor for high school and bachelor students.
REFERENCES AVAILABLE TO CONTACT	Alioscia Hama, Ph.D. (e-mail: alioscia.hamma@unina.it ; Phone: +39 081-676495) <ul style="list-style-type: none">• Professor, Department of Physics University of Naples Federico II◊ 2N34, Complesso Universitario di Monte Sant'Angelo Complesso universitario di Monte Sant'Angelo - Via Cinthia - 80126 - Naples★ <i>Dr. Hama is my Ph.D. advisor.</i> Seth Lloyd, Ph.D. (e-mail: slloyd@mit.edu ; Phone: +1 (617) 252 - 1803) <ul style="list-style-type: none">• Professor, Department of Mechanical Engineering Massachusetts Institute of Technology◊ 3-160, MIT 77 Massachusetts Avenue, Cambridge, Massachusetts 02139 Rahul Kulkarni, Ph.D. (e-mail: Rahul.Kulkarni@umb.edu ; Phone: +1 (617) 287-5408) <ul style="list-style-type: none">• Professor, Department of Physics University of Massachusetts Boston

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Claudio Chamon, Ph.D. (e-mail: chamon@bu.edu; Phone: +1 (617) 353-5787)
 • Professor, Department of Physics
 Boston University
 ◇ SCI, Room 319, BU 590 Commonwealth Avenue, Boston, MA 02215

AWARDS

2022 - Quantum Computing Summer School Fellowship - LANL

SCHOLARSHIPS

- *Fall 2021* - College of Science and Mathematics Dean's Doctoral Research Fellowship through fellowship
- *Spring 2022* - College of Science and Mathematics Dean's Doctoral Research Fellowship through fellowship

PUBLICATIONS

1. Lorenzo Leone, Salvatore F.E. Oliviero, Y. Zhou, Alioscia Hamma
Stabilizer Rényi entropy
[Physical Review Letters 128, 050402\(2022\)](#)
2. Salvatore F.E. Oliviero, Lorenzo Leone, You Zhou, Alioscia Hamma
Stability of topological purity under random local unitaries
[SciPost Phys. 12, 096 \(2022\)](#)
3. Salvatore F.E. Oliviero, Lorenzo Leone, Alioscia Hamma
Transitions in entanglement complexity in random quantum circuits by measurements
[Physics Letters A, 127721\(2021\)](#)
4. Lorenzo Leone, Salvatore F.E. Oliviero, You Zhou, Alioscia Hamma
Quantum Chaos is Quantum
[Quantum, volume 5, page 453 \(2021\)](#)
5. Salvatore F.E. Oliviero, Lorenzo Leone, Francesco Caravelli, Alioscia Hamma
Random Matrix Theory of the Isospectral Twirling
[SciPost Phys. 10, 076 \(2021\)](#)
6. Lorenzo Leone, Salvatore F.E. Oliviero, Alioscia Hamma
Isospectral twirling and quantum chaos
[Entropy 2021, 23\(8\), 1073](#)

PREPRINTS

7. Lorenzo Leone, Salvatore F.E. Oliviero, Stefano Piemontese, Sarah True, Alioscia Hamma
Learning a mocking black hole
<https://doi.org/10.48550/arXiv.2206.06385>
8. Salvatore F.E. Oliviero, Lorenzo Leone, Alioscia Hamma
Magic of the ground state of the transverse field Ising model
<https://doi.org/10.48550/arXiv.2205.02247>
9. Lorenzo Leone, Salvatore F.E. Oliviero, Alioscia Hamma
Magic hinders quantum certification
<https://doi.org/10.48550/arXiv.2204.02995>
10. Salvatore F.E. Oliviero, Lorenzo Leone, Alioscia Hamma, Seth Lloyd
Measuring magic on a quantum processor
<https://arxiv.org/abs/2204.00015>

WORKS IN
PREPARATION

1. Salvatore F.E. Oliviero, Lorenzo Leone, Alioscia Hama
Efficient Clifford-decoding quantum information scrambled by $\mathcal{O}(n)$ T gates
2. Lorenzo Leone, Salvatore F.E. Oliviero, Lukasz Cincio, Marco Cerezo
On the practical usefulness of the Hardware Efficient Ansatz

ORAL AND
POSTER
PRESENTATIONS

- “Stabilizer Rényi entropy”, APS March Meeting, 17 March 2022, Oral Presentation
- “Emergence of Gibbs distribution in quasi-adiabatic regime”, CNLS Los Alamos, Oral Presentation

PROGRAMMING
SKILLS

Mathematica, Matlab, Python, C, C++, LaTeX

OTHER INTERESTS

Swimming, Running, Music.