Dynamics of coupled quantum systems

Ohanesjan, V.

Acknowledgements

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In the last year of my Ph.D. I re-connected with my mentor from the bachelor studies Irina Petreska, and, together with Trifce Sandev, we started working on mixing classical stochasticity and unitary evolution of quantum systems. Thank you for introducing me to this field, it came at a time when I was looking for new challenges and has been a source of inspiration ever since. In the same year, while learning and navigating stochastic waters, I met Benjamin Walter and each day of discussing or working together has been a delightful experience. My Ph.D. journey would have been even better if we had met at the last conference before the pandemic, rather than the first after, but I am glad our paths crossed. I am looking forward to working on all our envisioned projects.

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was a refreshing breeze during the heat storms of physics. Unfortunately, our office life was interrupted by the pandemic, but I am happy we are office-mates all over again for you have been my mentor and guide on Dutch society and there is still so much more I need to learn. Here, I want to thank NWO for funding my thesis, Leiden University for hosting me, the secretariat of the Lorentz Institute, and LION for all the help over the years. Also, I would like to thank the staff at the ALICE High-Performance Computing facility for allowing me to conduct most of the numerical studies.

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Curriculum Vitae

I was born, on 20$^{\text{th}}$ June 1991, and raised in Prilep, Republic of Macedonia. I had my secondary education at the local gymnasium "Mirče Acev" where I developed an interest in natural sciences.

After considering the idea of continuing my higher education in genetics and virology for a while, I decided to enroll in theoretical physics at the Ss. Cyril and Methodius University in Skopje, a decision I've enjoyed ever since. During my bachelor's studies, I worked on developing a Schlieren imaging setup, applications of the Hubbard model, and charge transport in molecular rotors. I also explored topics in strongly interacting electronic systems, for which in 2012 I attended a workshop at ICTP in Trieste, Italy, and later in particle physics which in 2013 led to my first international internship at CERN where I worked on an analysis of proton-proton collision data at the ALICE collaboration. Inspired by this internship, and my growing interest in the field, I decided to pursue a Master's degree in High-Energy Physics (HEP).

For this endeavor, I chose the joint program between École Polytechnique and ETH Zürich. During the first year, at École Polytechnique, I studied the foundations of theoretical and experimental HEP concluding it with a thesis on "Measurement of the Higgs boson width" in the CMS collaboration. For the second year of the master's program I moved to ETH Zürich where I focused on integrable systems, CFTs, holography, and string theory and graduated with a thesis on "Bootstrapping of meromorphic conformal field theories". During a gap year, after obtaining my Master's degree, I continued working on holographic theories and then took an internship at the Institute for Particle Physics and Astrophysics at ETH Zürich, where I worked on the observation of Higgs boson decay to bottom quarks with the CMS experiment at CERN.

Subsequently, I pursued my Ph.D. at Leiden University in the "Scanning New Horizons: Emergent Space-Time, Black Holes and Quantum Information" program. My research encompassed the thermalization of quantum systems, quantum information, transport in SYK chains, and holographic superconductors. Toward the end of my Ph.D., I became interested in the dynamics of quantum systems under stochastic resetting, leading to a research visit at SISSA in Trieste, Italy. Scientific results from my time at Leiden University have been presented at many national and international conferences.

List of Publications

- Floris Balm, Nicolas Chagnet, Sam Arend, Joost Aretz, Kevin Grosvenor, Martijn Janse, Ole Moors, Jonah Post, Vladimir Ohanesjan, David Rodriguez-Fernandez, Koenraad Schalm, Jan Zaanen, *T-linear resistivity, optical conductivity and Planckian transport for a holographic local quantum critical metal in a periodic potential*, Phys.Rev.B 108 (2023) 125145 [arXiv:2211.05492].
- V. Ohanesjan, Y. Cheipesh, N. V. Gnezdilov, A. I. Pavlov, K. Schalm, *Energy dynamics, information and heat flow in quenched cooling and the crossover from quantum to classical thermodynamics*, JHEP 05 (2023) 237 [arXiv:2204.12411].
- N. V. Gnezdilov, A. I. Pavlov, V. Ohanesjan, Y. Cheipesh, K. Schalm, *Ultrafast dynamics of cold Fermi gas after a local quench*, Phys. Rev. A 107, L031301 (2023) [arXiv:2108.12031].
- Y. Cheipesh, A. I. Pavlov, V. Ohanesjan, K. Schalm, N. V. Gnezdilov, *Quantum tunneling dynamics in a complex-valued Sachdev-Ye-Kitaev model quench-coupled to a cool bath*, Phys. Rev. B 104, 115134 (2021) [arXiv:2011.05238].
- Irina Petreska, Vladimir Ohanesjan, Ljupco Pejov, Ljupco Kocarev, *Tunneling of electrons via rotor-stator molecular interfaces: combined ab initio and model study*, Chem. Phys., 473 (2016) p. 32 [arXiv:1509.00848]