Qiongyuan Wu | qiongyuan.wu@qub.ac.uk

Research Fellow, Queen's University Belfast

Research topics: Quantum non-equilibrium thermodynamics, Levitated nanoparticles, Shortcut-to-adiabacity

Qiongyuan Wu Qiongyuan's Blog

Skills

Software:	Mathematica, Python
Academic skill:	Publication of journal papers and presentation in conferences Collaboration with local and international scholars
Administrative skill:	Tutoring / marking at the university (2017 - 2023) Experience of hosting school-scale events
Project management:	Regular meetings and reports with international collaborators

Research Experience and Education

- **Research Fellow, Queen's University Belfast** *(Aug 2023 - Dec 2024)*
  Non-Equilibrium Steady-States of Quantum many-body systems: uncovering universality and thermodynamics (QuamNESS)
  Grant: EPSRC
- PhD in theoretical physics, Queen's University Belfast *(Jun 2019 - Dec 2023)*
  Thermodynamic control and characterisation of levitated quantum systems
  Grant: The Leverhulme Trust
- Visitor at Vienna Center for Quantum Science and Technology (VCQ) *Oct 2022*
- Attendance of IQIS 2022, Palermo *Sep 2022*
- Attendance of Winter College on Optics, ICTP Trieste (Second best presentation award) *Feb 2020*
- MPhil in theoretical physics, Queen's University Belfast *(Oct 2016 - Apr 2019)*
  Testing the robustness of quantum correlations in multipartite systems
- Training project at Nanyang Technological University (Santander Mobility Scholarship) *July 2017*
- B.Sc in mathematics, East China University of Science and Technology *(Sep 2012 - Jun 2016)*
- Exchange student at Queen's University of Belfast *Sep 2015 – Jun 2016*

Awards

- Second best presentation at Winter College on Optics, ICTP Trieste *Feb 2020*
- Santander Mobility Scholarship *Nov 2017*

Publication list

[1] **Qiongyuan Wu**, Diana Chisholm, et al. **Mar. 2024**. "Squeezing below the ground state of motion of a continuously monitored levitating nanoparticle". In: *arXiv e-prints*. DOI: 10.48550/arXiv.2403.18790.

[2] Rafael Muffato, Tiberius Georgescu, [...], **Qiongyuan Wu**, et al. **Jan. 2024**. "Generation of classical non-Gaussian distributions by squeezing a thermal state into non-linear motion of levitated optomechanics". In: *arXiv e-prints*. DOI: 10.48550/arXiv.2401.04066.

[3] **Qiongyuan Wu**, Mario A. Ciampini, et al. **May 2023**. "Quantifying protocol efficiency: A thermodynamic figure of merit for classical and quantum state-transfer protocols". In: *Phys. Rev. Res.* 5 (2), p. 023117. DOI: 10.1103/PhysRevResearch.5.023117.

[4] **Qiongyuan Wu** and Matteo Carlesso. **Mar. 2023**. "Non-equilibrium quantum thermodynamics of a particle trapped in a controllable time-varying potential". In: *Quantum Sensing, Imaging, and Precision Metrology*. Ed. by Jacob Scheuer and Selim M. Shahriar. Vol. 12447. International Society for Optics and Photonics. SPIE, p. 1244714. DOI: 10.1117/12.2657707.

[5] **Qiongyuan Wu**, Luca Mancino, et al. **Feb. 2022**. "Nonequilibrium Quantum Thermodynamics of a Particle Trapped in a Controllable Time-Varying Potential". In: *PRX Quantum* 3 (1), p. 010322. DOI: 10.1103/PRXQuantum.3.010322.

[6] **Qiongyuan Wu**, Giovanni Barontini, et al. **Feb. 2020**. "Non-equilibrium thermodynamics of quantum processes assisted by transitionless quantum driving: the role of initial state preparation". In: *arXiv e-prints*. DOI: 10.48550/arXiv.2002.06134.