Taufiq Murtadho

PhD Candidate · Nanyang Technological University (NTU)

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Education

Nanyang Technological University (NTU) *Singapore*

PhD Candidate in Physics *August 2022 - Present*

- Bridging theory and experiments in ultracold quantum gases
- Advisor: Prof. Nelly Ng Huei Ying
- In close collaboration with low-dimensional Bose gases experiments led by Prof. Jörg Schmiedmayer (TU Wien)

University of Science and Technology (UST) *Republic of Korea*

M.Sc in Physics *March 2021 - August 2022*

- Institute for Basic Science (IBS) Campus, Center for Theoretical Physics of Complex Systems (PCS)
- Carried out independent research on thermodynamics of quantum synchronization
- Advisor: Dr. Juzar Thingna

Korea Advanced Institute of Science and Technology (KAIST) *Republic of Korea*

B. Sc in Physics *September 2016 - February 2021*

- Graduated with *Cum-laude*
- Minor in Nuclear & Quantum Engineering

Publications

Published

Murtadho, T., Cataldini, F., Erne, S., Gluza, M., Tajik, M., Schmiedmayer, J., & Ng, N. H. Measurement of total phase fluctuation in cold-atomic quantum simulators. *Physical Review Research*, 7(2), L022031 (2025).

Murtadho, T., Gluza, M., Arifa, K. Z., Erne, S., Schmiedmayer, J., & Ng, N. H. Y. Systematic analysis of relative phase extraction in one-dimensional Bose gases interferometry. *SciPost Physics*, 18(2), 065 (2025).

Murtadho, T., Thingna, J., & Vinjanampathy, S. Deriving lower bounds on the efficiency of near-degenerate thermal machines via synchronization. *Physical Review A*, 108(1), 012205 (2023).

Murtadho, T., Vinjanampathy, S., & Thingna, J. Cooperation and competition in synchronous open quantum systems. *Physical Review Letters*, 131(3), 030401 (2023).

In Review

Murtadho, T., Gluza, M., & Ng, N. H. Extensive entanglement between coupled Tomonaga-Luttinger liquids in and out of equilibrium. arXiv:2508.20533 (2025).

Conference Talks

Invited Talks

Extensive entanglement between 1D quantum many-body systems: from theory to experiment. IPS (Institute of Physics Singapore) Meeting at National University of Singapore (September 2025).

Contributed Talks

Expanding possible measurements in 1D quasicondensates for studying thermalization near integrability. Quantum Thermodynamics (QTD) conference at National University of Singapore (July 2025).

Systematic analysis of relative phase extraction in 1D Bose gases interferometry. German Physical Society (DPG) Spring Meeting on Atomic, Molecular, Quantum Optics and Photonics Section in Freiburg, Germany (March 2024).

Systematic analysis of relative phase measurement in 1D atom interferometry. IPS (Institute of Physics Singapore) Meeting at National University of Singapore (September 2023).

Teaching & Outreach Experience

Teaching Experience

Teaching Assistant for "Special Relativity & Quantum Physics" course (2023 - 2025) at NTU: Taught tutorial classes of total size around 40 students, prepared quiz questions and solutions, graded assignments, and provided one-to-one consultation.

Physics Lab Assistant for Undergraduate Experimental Physics course (2024) at NTU: Supervised undergraduate laboratory experiments and was named best lab assistant award in 2024.

Outreach Experience

Script & Content Writer for Kok Bisa (Freelance): I write video scripts and articles about scientific topics in simple and engaging ways. Kok Bisa Youtube Channel has 6 millon+ subscribers.

Senior Writer at What Is Up, Indonesia (2022 - present): I write and edit content on Indonesia's sociopolitical issues in English for international audience and internationally-raised Indonesians. Our Instagram has 400,000+ followers.

Project Consultant at Wolfram (2020 - 2021): Developer at Algorithm R&D department with the main task of developing a Quantum Computing framework in *Mathematica*.