# Dr. Jirawat Saiphet

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Tübingen, Germany

Quantum physicist and postdoc researcher.

## Skills

**Expertise:** Quantum Computing, Quantum Information, Tensor Networks, Many-body Physics, Machine Learning
**Software:** TenPy, NumPy, MLX, PyTorch, CCXT, Docker, Git, Whisper, Ollama
**Languages:** Python, C++, Rust, Shell

## Experience

**PhD student** *06/2021 - 08/2025*
*Universität Tübingen* *Tübingen, Germany*

- Collaborated with theory and experimental groups in Ulm.
- Developed tensor network simulations of strongly interacting nitrogen-vacancy (NV) centers in diamond.
- Explored the limitations in simulating the dynamics of NV clusters under interaction, disorder, and dissipation.
- Investigated quantum fisher information and entanglement generation, and achieved highly sensitive probe states composed of collective spins using optimal control methods.

**Quantum algorithm researcher** *02/2021 - 05/2021*
*Quantum Technology Foundation (Thailand)* *Bangkok, Thailand*

- Collaborated with Kasikorn Business Technology Group (KBTG).
- Explored an application of quantum algorithms in financial sector challenges, with focus in a loan-loss provision modeled as quadratic constrained binary optimization(QCBO).
- Proposed a quantum-classical hybrid approach.
- Developed a proof-of-concept code to demonstrate the algorithm's functionality on a mocked dataset.

**Master student** *08/2019 - 05/2021*
*Mahidol University.* *Bangkok, Thailand*

- Conducted research on Quantum Approximate Optimization Algorithm (QAOA) using IBM's *Qiskit*.
- Evaluated the QAOA's potential in solving clustering problems.
- Benchmarked QAOA's performance against the classical *K-means* clustering algorithm.

**Undergraduate student** *08/2015 - 06/2019*
*Mahidol University.* *Bangkok, Thailand*

- Conducted research on decoherence suppression in a single qubit by quantum delayed feedback based on the no-knowledge measurement.
- Analytically derived compatible results between the Itô and Stratonovich stochastic master equations.
- Provided analytical solutions for delayed feedback where the measurement operator commutes with a unitary operator, supplemented by numerical results for the general case.

## Publications

[1] J. Saiphet and D. Braun, "Simulation of the dissipative dynamics of strongly interacting nitrogen-vacancy centers with tensor networks," *Phys. Rev. A*, vol. 111, no. 2, p. 22604, Feb. 2025, doi: 10.1103/PhysRevA.111.022604.

[2] J. Tangpanitanon *et al.*, "Hybrid Quantum-Classical Algorithms for Loan-Collection Optimization with Loan-Loss Provisions," *Phys. Rev. Appl.*, vol. 19, no. 6, p. 64001, Jun. 2023, doi: 10.1103/PhysRevApplied.19.064001.

[3] J. Saiphet, S. Suwanna, T. Chotibut, and A. Chantasri, "Quantum approximate optimization and k-means algorithms for data clustering," *Journal of Physics: Conference Series*, vol. 1719, no. 1, p. 12100, Jan. 2021, doi: 10.1088/1742-6596/1719/1/012100.

[4] J. Saiphet, S. Suwanna, A. R. R. Carvalho, and A. Chantasri, "Time-delayed quantum feedback and incomplete decoherence suppression with a no-knowledge measurement," *Phys. Rev. A*, vol. 103, no. 2, p. 22208, Feb. 2021, doi: 10.1103/PhysRevA.103.022208.

[5] J. Saiphet, A. Chantasri, and S. Suwanna, "Effects of time delay in no-knowledge quantum feedback control," *Journal of Physics: Conference Series*, vol. 1380, no. 1, p. 12113, Nov. 2019, doi: 10.1088/1742-6596/1380/1/012113.

## Education

**Eberhard Karls Universität Tübingen** *2021 - 2025*
**Ph.D.** | *Physics (quantum metrology)* *Tübingen, Germany*
***Supervisor: Prof. Daniel Braun***

**Mahidol University** *2019 - 2021*
**M.Sc.** | *Physics* *Bangkok, Thailand*
***Supervisor: Assoc. Prof. Areeya Chantasri***

**Mahidol University** *2015 - 2019*
**B.Sc.** | *Physics* *Bangkok, Thailand*
***Supervisor: Asst. Prof. Sujin Suwanna***

## References

**Prof. Daniel Braun**
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