

## ***Unit Name***

Experimental Quantum Information Physics

## **Students Supervised:**

- Zhenghan Yuan (PhD Student)
- Shin Sun (PhD Student)
- Shuma Oya (PhD Student)
- Mathieu Couillard (PhD Student)
- Steven Jeffrey Marz (PhD Student)
- Savelii Dudoladov (PhD Student)
- Morihiro Ohta (PhD Student)
- Tatsuki Hamamoto (PhD Student)
- Soon Teh (PhD Student)
- Markus Fuhrmann (Research Intern)
- Renze Theodor Suters (Research Intern)
- Shingo Ishimori (Research Intern)
- Debdip Guchait (Research Intern)
- Abhijit Kundu (Research Intern)
- Vincent Philippe Marie Sietses (Research Intern)
- Nikolaos Kokkinidis (Research Intern)
- David-Michael Orion Peterson (Research Intern)
- Apostolos Banoutsos (Research Intern)
- Natakala Saimurali Dakshesh (Research Intern)
- Shingo Ishimori (Visiting Research Student)
- Bin Huang (Visiting Research Student)

## ***Scholarly Contributions and Creative Productions (by Faculty)***

### ***Journal Article***

1. Takahashi, Hiroki. 2025. "How to Integrate a Miniature Optical Cavity in a Linear Ion Trap: Shielding Dielectrics and Trap Symmetry." *Physical Review Applied* 23 (February).
2. Takahashi, Hiroki. 2024. "Rate-Fidelity Trade-off in Cavity-Based Remote Entanglement Generation." *Physical Review A* 110 (October).  
<https://doi.org/10.1103/PhysRevA.110.042405>
3. Takahashi, Hiroki. 2024. "Ion Trapping with a Laser-Written 3D Miniaturized Monolithic Linear Paul Trap for Microcavity Integration." *ArXiv*, September.

<http://arxiv.org/abs/2409.05075v2>

4. Takahashi, Hiroki. 2024. "Dielectric Microwave Resonator with Large Optical Apertures for Spin-Based Quantum Devices." Applied Physics Letters 124 (June).

**Poster Presentation at Conference**

1. Takahashi, Hiroki. 2024. "Loss-Tolerant Mølmer-Sørensen Gates in Coupled Cavity Systems." Okinawa School in Physics: Coherent Quantum Dynamics- CQD 2024.

**Presentation at Conference**

1. Takahashi, Hiroki. 2024. "Towards Photonic Interconnects between Ion Traps." JSAP (応用物理学会九州支部学術講演会), December.
2. Takahashi, Hiroki. 2024. "Towards Photonic Interconnects between Ion Traps." 第9回フォトニクスワークショップ (応用物理学会フォトニクス分科会), November.
3. Takahashi, Hiroki. 2024. "Towards Photonic Interconnects between Ion Trap Quantum Computers ." The 7th QST International Symposium, July.
4. Takahashi, Hiroki. 2024. "Ion Trap Cavity QED." Ultracold Atoms Japan, April.
5. Takahashi, Hiroki. 2024. "イオントラップによる光接続型誤り耐性量子コンピュータ." ムーンショット目標6 公開シンポジウム, March.
6. Takahashi, Hiroki. 2024. "Towards Photonic Interconnects between Ion Traps." Japan-Denmark Symposium on Practical Quantum Computing, February.

**Scholarly Contributions (by Unit Members)**

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Steven Marz	Poster Presentation at Conference	Tunable microcavities for ion-photon quantum networks	Moonshot Goal 6 Symposium2025-Internal General Meeting	Japan Science and Technology Agency	2025
Ezra Kassa	Poster Presentation at Conference	On the integration of miniature optical cavities with a linear ion trap for quantum networking	NACTI	University of California, Los Angeles	2024
Ezra Kassa	Poster Presentation at Conference	Integration of a fiber cavity with a miniature linear ion trap	OIST Innovation Tea Time	OIST	2024
Vishnu Kavungal	Poster Presentation at Conference	Integration of a fiber cavity with a miniature linear ion trap	OIST Innovation Tea Time	OIST	2024
Shuma Oya	Poster Presentation at Conference	Integration of a fiber cavity with a miniature linear ion trap	ムーンショット目標6 公開シンポジウム 2024	Japan Science and Technology Agency	2024
Ezra Kassa	Poster Presentation at Conference	On the integration of miniature optical cavities with a linear ion trap for quantum networking	ICAP28	Imperial College, London, UK	2024
Shuma Oya	Poster Presentation at Conference	Integration of a fiber cavity with a miniature linear ion trap	AQTTI	OIST	2024

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Ezra Kassa	Poster Presentation at Conference	Monolithic Miniature 3D Linear Trap for Cavity Integration	NTT x OIST Joint Workshop	OIST	2024
Zhengan Yuan	Poster Presentation at Conference	Efficient single photon generation from a single ion coupled to a fibre cavity in a linear trap	Moonshot Goal 6 Symposium2025-Internal General Meeting	Japan Science and Technology Agency	2025
Savelii Dudoladov	Poster Presentation at Conference	Progress Towards Cavity QED with Trapped Barium Ions Coupled to a Miniature Optical Cavity	Moonshot Goal 6 Symposium2025-Internal General Meeting	Japan Science and Technology Agency	2025
Seigen Nakasone	Presentation at Conference	Implementing an FPGA-based Photon Counter as a Trapped-Ion Detector	SICE2024	The Society of Instrument and Control Engineers Annual Conference	2024
Shuma Oya	Presentation at Conference	線形イオントラップと光共振器の統合に向けた設計と作製	日本物理学会 第79回年次大会	The Physical Society of Japan	2024
Ezra Kassa	Presentation at Conference	Ion traps and cavities for quantum networks	Project Showcase POC	OIST	2025
Shaobo Gao	Presentation at Conference	Integrating a fibre cavity with an ion trap for scalable quantum computing	Quantum 2.0 Conference and Exhibition	Optica	2024

#### ***Outreach Activities (For Unit Members Only)***

2024-07-04 Ezra Kassa, Ion traps at OIST, OIST