

Unit Name

Networked Quantum Devices Unit
Associate Professor David Elkouss

Research Personnel

Faedi Loulidi, Postdoctoral Scholar

Maria Quadeer, Postdoctoral Scholar

Thomas Rowan Scruby, Postdoctoral Scholar

Gomathi Subramanian Uthirakalyani, Postdoctoral Scholar

Ananda Gopal Maity, Postdoctoral Scholar, Senior researcher at Bose Center for basic sciences

Daniel Nadeem Bhatti, Staff Scientist

Iliia Ryzov, PhD Student

Jiajun Chen, PhD Student

Salome Catherine Hayes-Shuptar, PhD Student

Joshua Carlo Casapao, PhD Student

Shin Sun, PhD Student

Nawfel Mechiche Alami, Research Intern

Aastha Jayeshbhai Tripathi, Research Intern

Miyu Tsujiuchi, Research Intern

Marii Koyama, Research Intern

Martina Onetti, Research Intern

Shashank Shekhar, Fellow

Scholarly Contributions and Creative Productions (by Faculty)

Conference Proceedings

1. Corte, L. L.; Goodenough, K.; Maity, A. G.; Santra, S.; Elkouss, D.
Bayesian Optimization for Repeater Protocols. In 2025 International Conference on Quantum Communications, Networking, and Computing (QCNC); 2025.
2. Casapao, J.; Maity, A. G.; Benchasattabuse, N.; Hajdušek, M.; Soeda, A.; Van Meter, R.; Elkouss, D.
A Double Selection Entanglement Distillation-Based State Estimator. In 2025 IEEE International Conference on Quantum Computing and Engineering (QCE); 2025.
3. Hayes-Shuptar, S.; Bhatti, D.; Elkouss, D.
Linear Programming Approach for Demonstrating Network Nonlocality for Arbitrary Networks. In Proceedings of the 2nd Workshop on Quantum Networks and Distributed Quantum Computing; Association for Computing Machinery, 2025.

Journal Article

1. Sun, S.; Goodenough, K.; Bhatti, D.; Azuma, K.; Elkouss, D.

- Enhancing Quantum Key Distribution with Entanglement Distillation and Classical Advantage Distillation. *Physical Review A* 2025, 112.
2. Roga, W.; Elkouss, D.; Takeoka, M.; Shimizu, H.
Simple Loss-Tolerant Protocol for Greenberger-Horne-Zeilinger-State Distribution in a Quantum Network. *Physical Review A* 2025, 111, 022624.
 3. Montfort, Y.; De, B., S'ebastian; Elkouss, D.
Fault-Tolerant Structures for Measurement-Based Quantum Computation on a Network. *Quantum* 2025, 9, 1723.
 4. Martinez-Mateo, J.; Elkouss, D.
Efficient Reconciliation of Continuous Variable Quantum Key Distribution with Multiplicatively Repeated Non-Binary LDPC Codes. *EPJ Quantum Technology* 2025, 12, 71.
 5. Steinberg, M.; Fan, J.; Harris, R. J.; Elkouss, D.; Feld, S.; Jahn, A.
Far from Perfect: Quantum Error Correction with (hyperinvariant) Evenbly Codes. *Quantum* 2025, 9, 1826.
 6. Lemus, M.; Schiansky, P.; Goulão, M.; Bozzio, M.; Elkouss, D.; Paunković, N.; Mateus, P.; Walther, P.
Performance of Practical Quantum Oblivious Key Distribution. *PRX Quantum* 2025.
<https://doi.org/10.1103/j8mt-c124>
 7. Kaufmann, N.; Quadeer, M.; Elkouss, D.
Estimating Bell Diagonal States with Separable Measurements. *Physical Review A* 2025, 112.
 8. Anderson, D.; Chomaz, P.; Takeuchi, S.; Arakawa, Y.; Baba, Y.; Benson, O.; Soderberg, K.-A. B.; Diamanti, E.; Elkouss, D.; Fujii, K.; Furusawa, A.; Gouzien, E.; Katori, H.; Kawabata, S.; Kawahara, T.; Kosaka, H.; Marinkovic, M.; Miyamoto, Y.; Mizuochi, N.; Muraio, M.; Nemoto, K.; Ohmori, K.; Ohshima, T.; Polzik, E.; Radulaski, M.; Sangouard, N.; Takahashi, Y.; Tanaka, U.; Tarucha, S.; Villaresi, P.; Yu, N.; Zivy, J.
[The Future of Quantum Technology as Seen from the EU, USA and Japan: Experts' Vision over the next Two Decades](#). *Journal of Physics B* 2025.
 9. Casapao, J. C. A.; Maity, A. G.; Benchasattabuse, N.; Hajdušek, M.; Van Meter, R.; Elkouss, D.
Disti-Mator: An Entanglement Distillation-Based State Estimator . *Communications Physics* 8 2025.
 10. Steinberg, M.; Fun, J.; Harris, R. J.; Elkouss, D.; Feld, S.; Jahn, A.
Far from Perfect: Quantum Error Correction with (Hyperinvariant) Evenbly Codes. *Quantum* 9, 1826.

Presentation at Conference

1. Elkouss, D.
Distimation, Partial State Tomography from Distillation Outcomes. *SCOPOSIS* 2025.
2. Elkouss, D.
Optimizing NISQ Networks for Applications. *PQE* 2025 2025.
<https://www.pqeconference.com/>
3. Elkouss, D.
The Promise and Challenges of the Highly Modular Approach for Quantum Information Processing. *IEEE Photonics Society Summer Topicals* 2025 2025.
<https://www.ieee-sum.org/>
4. Elkouss, D.
Evaluating Network Performance: From Analytics to Simulation. *IEEE QCE 2025 Workshop on Quantum Network Simulations* 2025.
<https://qce.quantum.ieee.org/2025/>
5. Elkouss, D.
Progress in Quantum Networks. *Quantum Networks and Complexity* 2025.
<https://sites.google.com/view/qnc-workshop/speakers?authuser=0>

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Daniel Bhatti	Conference Proceedings	New approaches to multi-photon quantum interference and entanglement	Proceedings: Optica Quantum 2.0 Conference and Exhibition	Optica Publishing Group	2025-6/1
Faedi Loulidi	Journal Article	A Max-Flow Approach to Random Tensor Networks	Entropy	MDPI	2025
Jiajun Chen	Poster Presentation at Conference	Bacon-Shor Board Games	Quantum Innovation 2025		2025-7/29
Joshua Carlo Casapao	Poster Presentation at Conference	Disti-Mators: entanglement distillation-based state estimators	25th Asian Quantum Information Science Conference		2025-8/4
Joshua Carlo Casapao	Poster Presentation at Conference	Efficient state estimators for quantum networks	Quantum Innovation 2025		2025-7/29
Joshua Carlo Casapao	Presentation at Conference	A Double Selection Entanglement Distillation-based	2025 IEEE International Conference on Quantum Computing and Engineering (QCE)		2025-8/30
Sun Shin	Presentation at Conference	Enhancing Quantum Key Distribution with Entanglement Distillation and Classical Advantage Distillation	量子情報技術研究会 (QIT-52)		2025-5/28
Salome Hayes-Shuptar	Presentation at Conference	Linear Programming Approach for Demonstrating Network Nonlocality for Arbitrary Networks	2nd Workshop on Quantum Networks and Distributed Quantum Computing (QuNet)		2025-9/8
Uthirakalyani Gomathi Subramanian	Presentation at Conference	Converse for Fault tolerant Quantum Computation	International workshop on Quantum Information Engineering (2025)		2025-10-8
Thomas Scruby	Seminars	Rescheduling subsystem codes	Inria Paris		2025-9/24
Shin Sun	Seminars	Enhancing Quantum Key Distribution with Entanglement Distillation and Classical Advantage Distillation	NTT R&D, Atsugi		2025-7/9
Daniel Bhatti	Seminars	Distributing graph states with a photon-weaving quantum server	NTT R&D, Atsugi		2025-7/9
Daniel Bhatti	Seminars	Heralding Higher-Dimensional Bell and Greenberger-Horne-Zeilinger States Using Multiport Splitters	Institute for Experimental Physics at the University of Innsbruck		202-10-26
Daniel Bhatti	Seminars	Heralding Higher-Dimensional Bell and Greenberger-Horne-Zeilinger States Using Multiport Splitters	Theory colloquium at the University of Innsbruck		2025-10-15

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Jiajun Chen	Seminars	A Measurement Schedule for the Bacon-Shor Code with Constant-Size Detectors	2025 YITP Logical Gates for Encoded Qubits Workshop		2025-4-16
Salome Hayes-Shuptar	Presentation at Conference	Linear Programming Approach for Demonstrating Network Nonlocality	Quantum Innovation 2025		2025-7-29
Salome Hayes-Shuptar	Poster Presentation at Conference	Linear Program Witness for Network Nonlocality in Arbitrary Networks	Workshop "Nonlocality: Driver for Quantum Advantage?"		2026-3-9
Iliia Ryzov	Presentation at Conference	Properties of Computational Entanglement Measures	29th Annual Quantum Information Processing Conference 2026		2026-01-26

Honors, Awards & Fellowships

Term 1 2025 - Term 1 2025 IEEE Senior member, IEEE Senior member, 2025, IEEE [Fiscal Year: 2025-02-01]

Honors, Awards & Fellowships [By Unit Members Only]

Term 1 2025 - Term 1 2025 Jiajun Chen, Poster Presentation Awards for Young Researchers, 若手研究者ポスター賞, 2025, Quantum Innovation, Quantum Innovation 2025 若手研究者ポスター賞 [Fiscal Year: 2025-09-01]

Term 1 2025 - Ongoing Jiajun Chen, Google Phd Fellowship, Google Phd Fellowship, 2025, Google, Google Phd Fellowship [Fiscal Year: 2025-10-01]

External Service

Term 3 2025 - Term 2 2026 Co-track chair: International Conference on Quantum Communications, Networking, and Computing (QCNC 2026), IEEE [Fiscal Year: 2026-02-02]

Term 2 2025 - Term 1 2025 QuNet 2025 TPC member, ACM, SIGCOMM Workshop on Quantum Networks and Distributed Quantum Computing [Fiscal Year: 2025-09-01]

Term 3 2024 - Term 2 2025 Co-track chair: International Conference on Quantum Communications, Networking, and Computing (QCNC 2025), IEEE [Fiscal Year: 2025-02-02]

Term 2 2024 - Ongoing Guest editor IEEE Journal on Selected Areas in Communications, IEEE, Special issue: Building a More Secure Future: Developing Unbreakable Communication Protocols for the Quantum Era [Fiscal Year: 2024-03-01]

Term 1 2023 - Ongoing Associate editor IEEE Transactions on Networking, IEEE [Fiscal Year: 2025-02-20]

Term 1 2021 - Ongoing Associate editor ACM Transactions on Quantum Computing, ACM [Fiscal Year: 2025-02-09]

Outreach Activities [For Unit Members Only]

Term 1 2025 Shin Sun, Science Day Gunma 2025, Gunma Univeristy [Fiscal Year: 2025-10-27]

Term 1 2025 Sun Shin, Science event for Yokohama Science Frontier Highschool, OIST [Fiscal Year: 2025-10-22]

Term 1 2025 Shin Sun, Science event for Monoyama high school, OIST [Fiscal Year: 2025-10-12]

Term 1 2025 Shin Sun, Science event for Hakuyo high school, OIST [Fiscal Year: 2025-10-02]

Term 2 2025 Shin Sun, OIST SEED program: Odawa high school, OIST [Fiscal Year: 2025-10-08]

Workshops and Seminars [Organized and Hosted by Faculty/Units]

Speaker Name(s)	Title	Location	Co-Organizers	Date
Sneha Munshi	Full Network Nonlocality in Open Network Configuration	Center Building B503		2026-03-23
Yeong-Cherng Liang	From nonlocality transitivity to entanglement transitivity and more	Lab3 C700		2026-01-19
Xavier Bonet-Monroig	Squeezing the last bit of quantumness out of NISQ hardware	L5D23		2025-12-08
Pritam Halder	Preservation and Utilization of Quantum Correlations in Information Processing tasks	Center Building B503		2025-11-11
Konrad Banaszek	Security of optical key distribution under passive eavesdropping	L5D23		2025-11-06
	Okinawa School in Physics: From quantum key distribution to the quantum internet (OSP2025)	OIST Seaside House	OIST Center for Quantum Technology	2025-09-21
Wenyuan Wang	Decoy-state optical quantum information processing with coherent states	L5D23		2025-06-12