

Division of Electrical, Information and Communication Engineering	Research field	Quantum information theory	Lab. ID EI27
Laboratory web site	https://sites.google.com/view/kanazawa-qymgt/		
Research subjects			
<p>Quantum information processing, including quantum computing, is believed to offer significant advantages over conventional approaches in several respects. By harnessing quantum entanglement and superposition, it is expected to enable faster algorithms as well as secure and efficient communication, with growing applications in areas such as AI and machine learning. At its foundation lie the statistical structures and informational behaviors that arise from quantum entanglement. Our goal is to understand the essence of quantum information from a statistical perspective, through both theory and simulation, and to clarify what can and cannot be achieved.</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>In this laboratory, students are free to choose their own research topics. While the faculty primarily conducts theoretical research, students are not limited in their approach. They may tackle problems through mathematical proofs or analyze phenomena using numerical simulations. For numerical simulations, Python is the main programming language, with libraries such as numpy and sympy, and qiskit for quantum-related studies. A theoretical approach, on the other hand, requires the use of mathematical theorems and proof techniques. The knowledge and skills necessary for research can be acquired as needed. A collection of books is freely available in the laboratory, providing a supportive learning environment. Students with a strong background in linear algebra and statistics will find it especially smooth to make progress in their research.</p>			
Daily life in the laboratory, etc.			
<p>Each student has a desk partitioned for individual use and a personal LCD monitor, providing a space conducive to focused research. The laboratory is equipped with a computing server that can be used for numerical calculations and simulations. For discussions, there is a whiteboard and a large monitor, facilitating idea sharing and collaborative work. Books in the laboratory are freely available and the collection continues to grow. Additional books can be purchased upon request. Communication and consultation are conducted via Slack, creating an environment where students can easily interact and seek advice.</p>			
Message or comments by the laboratory faculty staffs			
<p>Quantum information is still a relatively new field and has been expanding rapidly in recent years. Many unsolved problems remain, leaving ample opportunities for students to make their own breakthroughs. We welcome those who are eager to explore novel ideas and take on unknown challenges.</p>			
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