

# Akira Sone

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Citizenship: Japan

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## Career interests

My research interests lie in broad areas in quantum information theory, quantum optics and nonequilibrium statistical mechanics. Particularly, I am interested in the quantum machine learning, quantum thermodynamics, quantum metrology, and quantum communication, and quantum physics education.

## Education

**Massachusetts Institute of Technology**, Cambridge, MA, USA. (September 3, 2013 ~ June 6, 2019)

**Ph.D. in Quantum Engineering (2019)**, Department of Nuclear Science and Engineering;

Thesis: “Quantum system identification by local measurements”

**Supervisor: Prof. Paola Cappellaro**

**Keio University**, Hiyoshi, Kanagawa, Japan (April 1, 2009 ~ Mar 10, 2013)

**Bachelor’s degree in engineering (2013)**, Department of Applied Physics and Physico-Informatics

Thesis: “Entanglement distribution in an open quantum system” (Best bachelor thesis prize)

**Supervisor: Prof. Naoki Yamamoto**

## Work experience

**University of Massachusetts Boston**, Boston, MA, USA. (September 1, 2022 ~ present)

**Assistant Professor.**

Department of Physics

**Aliro Technologies, Inc.**, Boston, MA, USA. (January 18, 2021 ~ August 31, 2022)

**Research Software Engineer.**

**Supervisor: Prof. Prineha Narang (currently the professor at University of California, Los Angeles)**

**Los Alamos National Laboratory**, Los Alamos, NM, USA. (September 16, 2019 ~ January 15, 2021)

**Postdoctoral Research Associate;**

Theoretical division and Center for Nonlinear Studies

**Supervisor: Dr. Patrick J. Coles (currently the chief scientist at Normal Computing)**

**Massachusetts Institute of Technology**, Cambridge, MA, USA. (August 12, 2019 ~ September. 07, 2019)

**Project Assistant (equivalent to Postdoctoral Scholar);**

Research Laboratory of Electronics

**Supervisor: Prof. Paola Cappellaro**

**Massachusetts Institute of Technology**, Cambridge, MA, USA. (September 3, 2013 ~ June 7, 2019)

**Research and Teaching Assistant;**

Department of Nuclear Science and Engineering and Research Laboratory of Electronics

**Supervisor: Prof. Paola Cappellaro**

## Grants

Award Year	Organization / Grant No.	Amount	Role	Start date and End date
2023	NSF/MPS-2328774	\$5,000,000.00	Co-PI	10/01/2023 ~ 09/30/2028
2024	NSF/PHY-2425180	\$900,000.00	Co-PI	08/15/2024 ~ 07/31/2027
2024	Massachusetts Technology Collaborative	\$3,800,000.00	Co-PI	05/14/2024 ~ 12/31/2027

## Current Research Projects

1. Quantum thermodynamics approach toward physical advantage and limitations in quantum generative models.
2. Entanglement symmetry from operational perspectives and their applications
3. Variational quantum algorithms for quantum metrology and sensing

## Publications (\* denotes “equally contributed”)

1. **Akira Sone**, Akram Touil, Kenji Maeda, Paola Cappellaro , and Sebastian Deffner, “No-go theorem for environment-assisted invariance in non-unitary dynamics”, [arXiv: 2503.10400](#) (2025)
2. **Akira Sone**, Diogo O. Soares-Pinto, and Sebastian Deffner, “Conditional quantum thermometry – enhancing precision by measuring less”, [Quantum Sci. Technol. 9 045018](#) (2024)
3. **Akira Sone**, Akira Tanji and Noaki Yamamoto, “Quantum Inception Score”, [Phys. Rev. Research 6, 033198](#) (2024)
4. Zidong Cui, Shan Jin, **Akira Sone**, and Xiaoting Wang, “Achieving quantum advantages for image filtering”, [Sci. China Phys. Mech. Astron. 67, 290362](#) (2024)
5. Kenji Maeda, Tharon Holdsworth, Sebastian Deffner and **Akira Sone**, “Detailed fluctuation theorem from one-time measurement scheme”, [Phys. Rev. A 108, L050203](#) (2023)
6. **Akira Sone**, Diogo O. Soares-Pinto, and Sebastian Deffner, “Exchange fluctuation theorems for strongly interacting quantum pumps”, [AVS Quantum Sci. 5, 032001](#) (2023)
7. **Akira Sone**, Naoki Yamamoto, Tharon Holdsworth, and Prineha Narang, “Jarzynski-like Equality of Nonequilibrium Information Production Based on Quantum Cross Entropy”, [Phys. Rev. Research 5, 023039](#) (2023)
8. C. Huerta Aldereta, Max Hunter Gordon, Frederic Sauvage, **Akira Sone**, Andrew T. Sornborger, Patrick J. Coles, M. Cerezo, “Inference-Based Quantum Sensing”, [Phys. Rev. Lett. 129, 190501](#) (2022)
9. Bingzhi Zhang, **Akira Sone**, and Quntao Zhuang, “Quantum Computational Phase Transition in Combinatorial Problems”, [npj Quantum Inf. 8, 87](#) (2022)
10. Jacob L. Beckey, M. Cerezo, **Akira Sone**, Patrick J. Coles, “Variational quantum algorithm for estimating the quantum Fisher information”, [Phys. Rev. Research 4, 013083](#) (2022)
11. **Akira Sone\***, M. Cerezo\*, Jacob L. Beckey, and Patrick J. Coles, “Generalized Measure of Quantum Fisher Information”, [Phys. Rev. A 104, 062602](#) (2021)

12. Samson Wang, Enrico Fontana, M. Cerezo, Kunal Sharma, **Akira Sone**, Lukasz Cincio and Patrick J. Coles, “Noise-Induced Barren Plateaus in Variational Quantum Algorithms”, [Nat. Commun. 12, 6961](#) (2021)
13. **Akira Sone** and Sebastian Deffner, “Jarzynski equality for conditional stochastic work”, [J. Stat. Phys 183, 11](#) (2021)
14. M. Cerezo, **Akira Sone**, Tyler Volkoff, Lukasz Cincio and Patrick J. Coles, “Cost function dependent barren plateaus in shallow parameterized quantum circuits”, [Nat. Commun. 12, 1791](#) (2021)
15. **Akira Sone** and Sebastian Deffner, “Quantum and classical ergotropy from relative entropies”, [Entropy 23, 1107](#) (2021)
16. M. Cerezo\*, **Akira Sone\***, Jacob L. Beckey, and Patrick J. Coles, “Sub-Quantum Fisher Information”, [Quantum Sci. Technol. 6 035008](#) (2021)
17. **Akira Sone**, Yi-Xiang Liu, and Paola Cappellaro, “Quantum Jarzynski Equality of Open Quantum Systems in One-Time Measurement Scheme”, [Phys. Rev. Lett. 125, 060602](#) (2020)
18. Yuanlong Wang, Daoyi Dong, **Akira Sone**, Ian Petersen, Hidehiro Yonezawa, Paola Cappellaro, “Quantum Hamiltonian Identifiability via Similarity Transformation Approach and Beyond”, [IEEE Trans. Autom. Control, 65, 4632](#) (2020)
19. **Akira Sone**, Quntao Zhuang, Changhao Li, Yi-Xiang Liu and Paola Cappellaro, “Nonclassical correlations for quantum metrology in thermal equilibrium”, [Phys. Rev. A 99, 052318](#) (2019)
20. **Akira Sone\***, Quntao Zhuang\*, and Paola Cappellaro, “Quantifying precision loss in local quantum thermometry via diagonal discord”, [Phys. Rev. A 98, 012115](#) (2018)
21. **Akira Sone** and Paola Cappellaro, “Exact dimension estimation of interacting qubit systems assisted by a single quantum probe”, [Phys. Rev. A 96, 062334](#) (2017)
22. **Akira Sone** and Paola Cappellaro, “Hamiltonian identifiability assisted by a single-probe measurement”, [Phys. Rev. A 95, 022335](#) (2017)

#### **Textbook / Book chapter**

1. **Akira Sone**, Kanu Sinha, and Sebastian Deffner, “Thermodynamic Perspective on quantum fluctuations”, [Encyclopedia of Mathematical Physics \(2<sup>nd</sup> ed\), vol 2, 224 – 236](#) (2025)

#### **Technical and invited talks**

1. **Akira Sone**, “Variational Quantum Algorithms and the Path to Quantum Sensing in NISQ Era”, invited talk at Physics and Astronomy Colloquia at **Dartmouth College**, Hanover, NH, USA, February 2025
2. **Akira Sone**, “Exploring Quantum Generative Models from Quantum Communication Perspective”, invited talk at **63<sup>rd</sup> Sanibel Symposium** organized by **University of Florida**, St. Augustine Beach, FL, USA, March 2024

3. **Akira Sone**, “Reliability and Practicability of Noisy Intermediate-Scale Quantum Computers”, invited talk at Physics Colloquium at **University of Rhode Island**, Kingston, RI, USA, April 2023
4. **Akira Sone**, “Near-term Quantum Algorithms and Its Applications”, invited talk at Quantum Materials and Devices Seminar at **Harvard University**, Cambridge, MA, USA, February 2023
5. **Akira Sone**, “Near-term Quantum Computer and Its Application”, invited by Prof. Junko Ishi-Hayase at **Keio University**, Yokohama, Kanagawa, Japan, February 2023 (Virtual in Japanese).
6. **Akira Sone**, “Heat Exchange of Multipartite Quantum Systems”, Physics Colloquium at **University of Massachusetts Boston**, MA, USA, February 2023
7. **Akira Sone**, “Near-term Quantum Algorithms and Its Applications”, invited by Dr. Jian Feng Kong at **Institute of High-Performance Computing**, Singapore, January 2023 (Virtual)
8. **Akira Sone**, “Computational Phase Transition of Quantum Approximate Optimization Algorithms”, invited by Prof. Takahiro Sagawa at **University of Tokyo**, Hongo, Tokyo, Japan, October 2022 (Virtual)
9. **Akira Sone**, “Quantum Correlations in Heat Exchange of Multipartite Quantum Systems”, Physics Colloquium at **University of Maryland Baltimore County**, Baltimore, MD, USA, October 2022
10. **Akira Sone**, “Toward Practical Near-term Quantum Computers”, Physics Colloquium at **University of Rochester**, Rochester, NY, USA, March 2022
11. **Akira Sone**, “Noisy Intermediate-Scale Quantum Computer and Its Applications”, Electrical and Computer Engineering Colloquium at **University of Arizona**, Tucson, AR, USA, March 2022
12. **Akira Sone**, “Variational Quantum Algorithms for Quantum Sensing”, invited by Prof. Clarice Aiello at **University of California, Los Angeles**, Los Angeles, CA, USA, February 2022
13. **Akira Sone**, “Toward Practical Near-term Quantum Computers”, Physics Colloquium at **University of Arizona**, Tucson, AR, USA, February 2022 (Virtual)
14. **Akira Sone**, “Toward Practical Near-term Quantum Computers”, Physics Colloquium at **University of Massachusetts, Boston**, Boston, MA, USA, February 2022
15. **Akira Sone**, “Toward Practical Near-term Quantum Computers”, Physics Colloquium at **University of Alabama at Birmingham**, Birmingham, AL, USA, February 2022
16. **Akira Sone**, “Toward Practical Near-term Quantum Computers”, Physics Colloquium at **University of South Florida**, Tampa, FL, USA, February 2022
17. **Akira Sone**, “Dialogue with Nature through Quantum Information”, Electrical and Computer Engineering Colloquium at **New Mexico State University**, Las Cruces, NM, USA, September 2021 (Virtual)
18. **Akira Sone**, “Near-term Quantum Computer for Quantum Metrology”, Theoretical Physics Seminar at **University of Massachusetts, Lowell**, Lowell MA, USA, September 2021

19. **Akira Sone**, “Quantum Metrology assisted by Noisy Intermediate-Scale Quantum Computers”, invited by Prof. Paola Cappellaro at [Massachusetts Institute of Technology](#), Cambridge MA, USA, September 2021
20. **Akira Sone**, M. Cerezo, Jacob L. Beckey, and Patrick J. Coles, “Variational Quantum Algorithms for Estimating the Quantum Fisher Information”, invited by [Quantum Science Center](#), Oak Ridge TN, USA, October 2020
21. **Akira Sone**, “Quantum Jarzynski Equality of Open Quantum Systems”, invited by Prof. Howard Wiseman at [Griffith University](#), Brisbane, Australia, October 2020 (Virtual)
22. **Akira Sone**, “Quantum system identification by local measurement”, invited by Prof. Christopher Monroe at [University of Maryland, College Park](#), College Park, MD, USA, May 2019
23. **Akira Sone**, “Quantum system identification assisted by local measurement”, invited by Prof. Hersch Rabitz at [Princeton University](#), Princeton, NJ, USA, November 2018
24. **Akira Sone**, “Quantum system identification assisted by local measurement”, invited by Prof. Christopher Jarzynski at [University of Maryland, College Park](#), College Park, MD, USA, October 2018
25. **Akira Sone**, “Quantum system identification with a single quantum sensor”, invited by Prof. Daoyi Dong, Prof. Ian Petersen, and Prof. Matthew James at [New South Wales University and Australia National University](#), Canberra, Australia, August 2017
26. **Akira Sone**, “Quantum system identification assisted by single-probe measurement”, [MIT Center for Ultracold Atoms \(CUA\) Retreat](#), Plymouth, NH, USA, January 2017

#### Conference / Workshop presentations

1. **Akira Sone**, Kenji Maeda, Akram Touil, Paola Cappellaro, and Sebastian Deffner, “Limitations in the Quantum Operations to Achieve the Envariance Symmetry in Bipartite System”, [APS Global Physics Summit](#), Anaheim, CA, USA, March 2025
2. Kenji Maeda, Takuya Isogawa, Santiago Hernández-Gómez, Paola Cappellaro, Sebastian Deffner and **Akira Sone**, “Quantum Process Classification Assisted by Quantum Fluctuation Theorem” (Poster presentation), [APS Global Physics Summit](#), Anaheim, CA, USA, March 2025
3. **Akira Sone**, “Quantum sensing assisted by near-term quantum algorithms”, [Workshop on Quantum Information Science on the Intersections of Nuclear and AMO Physics](#), invited by Prof. Robin Côte, Boston, MA, USA, January 2025
4. **Akira Sone**, “Quantum Inception Score: A Quality Measure of Quantum Generative Models”, [AVS 70<sup>th</sup> International Symposium & Exhibition](#), Tampa, FL, USA, November 2024
5. **Akira Sone**, “Physical Advantage and Limitation of Quantum Generative Models”, [2024 Quantum Thermodynamics Conference \(QTD2024\)](#), College Park, Maryland, USA, August 2024
6. Kenji Maeda, Takuya Isogawa, Santiago Hernández-Gomez, Sebastian Deffner, Paola Cappellaro, and **Akira Sone**, “Quantum Process Discrimination by Quantum Fluctuation Theorems”, [2024](#)

**Quantum Thermodynamics Conference (QTD2024)**, College Park, Maryland, USA, August 2024

7. Shou-I Tang, Akram Touil, Sebastian Deffner, and Akira Sone, “Quantum Thermodynamic Speed Limit” (poster presentation), **2024 Quantum Thermodynamics Conference (QTD2024)**, College Park, Maryland, USA, August 2024
8. **Akira Sone** and Naoki Yamamoto, “Quantum Inception Score as an Expressivity Measure of the Quantum Generative Models”, **APS March Meeting**, Minneapolis, MI, USA, March 2024
9. Kenji Maeda, Tharon Holdsworth, Sebastian Deffner, and **Akira Sone**, “Irreversibility Measure by Utilizing the Quantum Fluctuation Theorem of One-Time Measurement Scheme”, **APS March Meeting**, Minneapolis, MI, USA, March 2024
10. Shou-I Tang, Akram Touil, Sebastian Deffner, and **Akira Sone**, “Quantum Speed Limit for the Information Processing of Quantum Thermodynamical Systems”, **APS March Meeting**, Minneapolis, MI, USA, March 2024
11. Tharon Holdsworth and **Akira Sone**, “Quantum Monge-Kantorovich Problem and the Time Dependent Two Qubit Marginal Problem”, **APS March Meeting**, Minneapolis, MI, USA, March 2024
12. **Akira Sone**, “Quantum Fluctuation Theorem of the One-Time Measurement Scheme”, **Workshop on non-equilibrium quantum thermodynamics: Stochastic models and experimental platforms**, Cambridge, MA, USA, June 2023
13. Kenji Maeda, Tharon Holdsworth, Sebastian Deffner, and **Akira Sone**, “Quantum Fluctuation Theorem of the Quantum Work Conditioned on the Initial Energy Measurement”, **APS DAMOP**, Spokane, WA, USA, June 2023
14. Kenji Maeda, Tharon Holdsworth, Sebastian Deffner, and **Akira Sone**, “Quantum Fluctuation Theorem of the Quantum Work Conditioned on the Initial Energy Measurement” (Poster presentation), **Maryland Quantum-Thermodynamics Symposium**, College Park, MD, USA, March 2023
15. Tharon Holdsworth, Naoki Yamamoto, Prineha Narang, and **Akira Sone**, “Quantum Cross Entropy in Integrated Fluctuation Theorems”, **APS March Meeting**, Las Vegas, NV, USA, March 2023
16. **Akira Sone**, Diogo Soares-Pinto, and Sebastian Deffner, “A Thermal State Conditioned on Pointer Bases and Its Properties”, **APS March Meeting**, Las Vegas, NV, USA, March 2023
17. Bingzhi Zhang, **Akira Sone**, and Quntao Zhuang, “Computational phase transition in Quantum Approximate Optimization Algorithm – the difference between hard and easy”, **APS March Meeting**, Chicago, IL, USA, March 2022
18. **Akira Sone** and Sebastian Deffner, “Jarzynski equality for conditional stochastic work” (Poster presentation), **DPG (Deutsche Physikalische Gesellschaft) Spring Meeting**, virtual, March 2021
19. **Akira Sone** and Sebastian Deffner, “Geometry of thermal state – thermodynamics of quantum and classical coherence”, **APS March Meeting**, virtual, March 2021



20. Jacob Beckey, **Akira Sone**, Marco Cerezo, and Patrick Coles, “Variational Quantum Algorithms for Quantum Sensor Evaluation”, [APS March Meeting](#), virtual, March 2021
21. Marco Cerezo, **Akira Sone**, Kunal Sharma, Tyler Volkoff, Lukasz Cincio, and Patrick Coles, “Barren Plateaus in Quantum Neural Networks”, [APS March Meeting](#), virtual, March 2021
22. Samson Wang, Enrico Fontana, Marco Cerezo, Kunal Sharma, **Akira Sone**, Lukasz Cincio, and Patrick Coles, “Noise-Induced Barren Plateaus in Variational Quantum Algorithms”, [APS March Meeting](#), virtual, March 2021
23. **Akira Sone**, Jacob L. Beckey, Marco Cerezo, and Patrick Coles, “Quantum Fisher Information estimation via hybrid quantum-classical computation” (Poster presentation), [Quantum Techniques in Machine Learning](#), Cambridge, MA, USA, November 2020
24. Marco Cerezo, **Akira Sone**, Tyler Volkoff, Kunal Sharma, Lukasz Cincio, and Patrick Coles, “Trainability of Quantum Neural Networks”, [Quantum Techniques in Machine Learning](#), Cambridge, MA, USA, November 2020
25. **Akira Sone**, Yi-Xiang Liu, and Paola Cappellaro, “Nonequilibrium work relations of open quantum systems in one-time measurement scheme”, [APS March Meeting](#), Denver, CO, USA, March 2020
26. Marco Cerezo, **Akira Sone**, Lukasz Cincio, and Patrick J. Coles, “Barren Plateau Issues for Variational Quantum-Classical Algorithms”, [APS March Meeting](#), Denver, CO, USA, March 2020
27. **Akira Sone**, Quntao Zhuang, Changhao Li, Yi-Xiang Liu, and Paola Cappellaro, “Role of nonclassical correlations in quantum parameter estimation assisted by a local measurement scheme in thermal equilibrium”, [APS March Meeting](#), Boston, MA, USA, March 2019
28. Xiaoyang Huang, Roberto Gauna, **Akira Sone**, and Paola Cappellaro, “Practical algorithm for determining Hamiltonian identifiability” (Poster presentation), [APS March Meeting](#), Boston, MA, USA, March 2019
29. **Akira Sone**, Quntao Zhuang, and Paola Cappellaro, “Nonclassical correlations in local quantum thermometry” (Poster presentation), [AQIS’18](#), Nagoya, Japan, September 2018
30. **Akira Sone** and Paola Cappellaro, “Quantum-assisted dimension estimation of an interacting qubit system”, [APS DAMOP](#), Fort Lauderdale, FL, USA, June 2018
31. **Akira Sone** and Paola Cappellaro, “Hamiltonian identifiability assisted via single-probe measurement”, [APS DAMOP](#), Sacramento, CA, USA, June 2017

#### News

1. Advancing the field of quantum thermodynamics, [MIT NSE News](#)
2. Solving ‘barren plateaus’ is the key to quantum machine learning, [Phys.org News](#)

#### Scholarships

1. **Funai Overseas Scholarship** (for Ph. D study), September, 2013 ~ August, 2015

2. **Postdoctoral Scholarship of Funai Foundation for Information Technology**, \$10,000/year, April, 2019 ~ March, 2020
3. **Postdoctoral Scholarship of Funai Foundation for Information Technology**, \$10,000/year, April, 2020 ~ March, 2021

### Certificate

**Kaufman Teaching Certificate**, May 2019 (Awarded from MIT)

### Teaching honors/awards

- (1) **Thomas G. Stockham Jr. Fellowship**, September 2018 ~ May 2019 (Awarded by School of Engineering, MIT)
- (2) **Outstanding Teaching Assistant Award** for exceptional contributions as a teaching assistant in Nuclear Science and Engineering, May 2016 (Awarded by Department of Nuclear Science and Engineering, MIT)

### Teaching experience

#### (1) Teaching Assistant at MIT

Year	Course title	Level/School
Fall 2015	Applied Nuclear Physics	Graduate, MIT
Spring 2018	Introduction to Applied Nuclear Physics	Undergraduate, MIT
Spring 2019	Atomic and Optical Physics II	Graduate, MIT
Spring 2019	Quantum Theory of Radiation Interaction	Graduate, MIT

#### (2) Assistant Professor at UMass Boston

Fall 2022	Quantum Information I	Undergraduate, UMass Boston
Spring 2023	Quantum Information III	Undergraduate, UMass Boston
Fall 2023	Quantum Control Theory	Graduate, UMass Boston
Spring 2024	Thermodynamics	Undergraduate, UMass Boston
Fall 2024	Introduction to Contemporary Physics (Special Relativity and Quantum Mechanics)	Undergraduate, UMass Boston
Spring 2025	Thermodynamics	Undergraduate, UMass Boston

(\* I am also a guest lecturer of graduate-level course 22.51 “Quantum Technology and Devices” at MIT)

### Current Students

Yifan Qian (Computational Science, UMass Boston, Ph.D.)

Shou-I Tang (Physics, UMass Boston, master)

Kenji Maeda (Physics, UMass Boston, undergraduate, Goldwater scholar)

### Previous Students

Tharon Holdsworth (Physics, UMass Boston, master); currently Texas A&M Ph. D. student, physics

Jacob L. Beckey (Physics, University of Colorado, Boulder, Summer 2020, at LANL)

Samson Wang (Physics, Imperial College of London, UK, Summer 2020, at LANL); currently Postdoc at IQIM, Caltech

Enrico Fontana (Computer Science, University of Strathclyde, UK, Summer 2020, at LANL)



**Professional Service**

Referee for

[Physical Review X](#)

[PRX Quantum](#)

[Physical Review Letters](#)

[Physical Review E](#)

[Physical Review A](#)

[Physical Review Research](#)

[New Journal of Physics](#)

[Communications Physics](#)

[Quantum, Quantum Science and Technology](#)

[Entropy](#)

[IEEE Transactions on Evolutionary Computation](#)

[IEEE Control Systems Letter](#)

[IEEE Transactions on Quantum Engineering](#)

[Europhysics Letters](#)

**Conference Service**

Session Chair of [APS March Meeting \(2023\)](#), [Maryland Quantum Thermodynamics Symposium \(2023\)](#), and [Workshop on Quantum Information Science on the Intersections of Nuclear and AMO Physics \(2025\)](#)

**Service at UMass Boston**

[Annual JFK Award Committee](#) for College of Science and Mathematics, UMass Boston, 2025

[Faculty Search Committee](#), UMass Boston, 2024

[Graduate Admission Committee](#), UMass Boston, 2022 - current

[Advisor of UMass Boston Graduate Physics Journal Club](#), 2022 - current

**Outreach**

Judge for iQuHACK (2023) at Massachusetts Institute of Technology, January 2023

**Referee Awards**

**IOP trusted reviewer** for peer review excellence, IOP Publishing, September 2020

**Techniques**

MATLAB, Mathematica, C++, Python

**Languages**

Japanese (native), Mandarin Chinese (fluent), English (fluent)