Ryotatsu Yanagimoto | Curriculum Vitae

Physics & Informatics Laboratories, NTT Research, Inc., Sunnyvale, CA 94085, USA
Phone: (650) 289-8955 • Email: ryotatsu.yanagimoto@ntt-research.com

Employment

NTT Research — **Sunnyvale, CA, USA**
Research Scientist — *Apr. 2024 – Present*
Postdoctoral fellow — *Apr. 2023 – Mar. 2024*

Education

Stanford University — **Stanford, CA, USA**
Ph.D. in Applied Physics (Research advisor: Prof. Hideo Mabuchi) — *Sep. 2017 – Apr. 2023*

- Dissertation title: "Quantum dynamics of broadband nonlinear photonics : from phenomenology to function"

The University of Tokyo — **Bunkyo-ku, Tokyo, Japan**
B.E. in Applied Physics (Research advisor: Prof. Hidetoshi Katori) — *Apr. 2013 – Mar. 2017*

- Dissertation title: "Characterization of collisional shifts in optical lattice clocks based on asymmetries in the Ramsey spectrum"

Research Activities

Cornell University — **Ithaca, NY, USA**
NTT postdoctoral fellow (PI: Prof. Peter L. McMahon) — *Apr. 2023 – Present*

Stanford University — **Stanford, CA, USA**
Graduate research (PI: Prof. Hideo Mabuchi) — *Sep. 2017 – Apr. 2023*

RIKEN — **Wako-shi, Saitama, Japan**
Research assistant (PI: Prof. Hidetoshi Katori) — *Apr. 2016 – Aug. 2017*

Durham University — **Durham, UK**
Research Intern (PI: Prof. Damian Hampshire) — *Jan. 2016 – Mar. 2016*

Publications and Preprints

* These authors contributed equally to the work

1. Valeria Cimini, Mandar M Sohoni, Federico Presutti, Benjamin K Malia, Shi-Yuan Ma, **Ryotatsu Yanagimoto**, Tianyu Wang, Tatsuhiro Onodera, Logan G Wright, Peter L McMahon, “Large-scale quantum reservoir computing using a Gaussian Boson Sampler”, arXiv:2505.13695.
2. Sridhar Prabhu, Vladimir Kremenetski, Saeed A Khan, **Ryotatsu Yanagimoto**, Peter L McMahon, “Exponential advantage in quantum sensing of correlated parameters”, arXiv:2504.21745.
3. **Ryotatsu Yanagimoto**, Benjamin A. Ash, Mandar M. Sohoni, Martin M. Stein, Yiqi Zhao, Federico Presutti, Marc Jankowski, Logan G. Wright, Tatsuhiro Onodera, Peter L. McMahon, “Programmable on-chip nonlinear photonics”, arXiv:2503.19861.
4. Chris Gustin*, **Ryotatsu Yanagimoto***, Edwin Ng, Tatsuhiro Onodera and Hideo Mabuchi, “Effective field theories in broadband quantum optics: modeling phase modulation and two-photon loss from cascaded quadratic nonlinearities”, Quantum Science and Technology **10,** 025035 (2025).
5. **R. Yanagimoto*,** E. Ng*, M. Jankowski, R. Nehra, T. P. McKenna, T. Onodera, L. G. Wright, R. Hamerly, A. Marandi, M. M. Fejer, H. Mabuchi, “Mesoscopic ultrafast nonlinear optics—The emergence of multimode quantum non-Gaussian physics”, Optica **11**, 896 (2024).
6. Marc Jankowski*, **Ryotatsu Yanagimoto***, Edwin Ng, Ryan Hamerly, Timothy P McKenna, Hideo Mabuchi, MM Fejer, “Ultrafast second-order nonlinear photonics—from classical physics to non-Gaussian quantum dynamics: a tutorial”, Advances in Optics and Photonics **16,** 347 (2024).
7. E. Ng*, **R. Yanagimoto***, M. Jankowski, M. M. Fejer, H. Mabuchi, “Quantum noise dynamics in nonlinear pulse propagation”, arXiv:2307.05464.
8. **R. Yanagimoto***, R. Nehra*, E. Ng, A. Marandi, H. Mabuchi, “Engineering cubic quantum nondemolition Hamiltonian with mesoscopic optical parametric interactions”, arXiv:2305.03260.
9. **R. Yanagimoto***, R. Nehra*, R. Hamerly, E. Ng, A. Marandi, H. Mabuchi, “Quantum nondemolition measurements with optical parametric amplifiers for ultrafast universal quantum information processing”, PRX Quantum **4**, 010333 (2023).
10. **R. Yanagimoto**, E. Ng, M. Jankowski, H. Mabuchi, R. Hamerly, “Temporal trapping: a route to strong coupling and deterministic optical quantum computation”, Optica **9**, 1289 (2022).
11. **R. Yanagimoto***, E. Ng*, A. Yamamura, T. Onodera, L. G. Wright, M. Jankowski, M. M. Fejer, P. L. McMahon, H. Mabuchi, “Onset of non-Gaussian quantum physics in pulsed squeezing with mesoscopic fields”, Optica **9**, 379 (2022).

12. **R. Yanagimoto**, E. Ng, L. G. Wright, T. Onodera, H. Mabuchi, “Efficient simulation of ultrafast quantum nonlinear optics with matrix product states,” Optica **8**, 1306 (2021).
13. **R. Yanagimoto***, E. Ng*, T. Onodera, H. Mabuchi, “Towards an engineering framework for ultrafast quantum nonlinear optics,” Proc. SPIE 11684, Ultrafast Phenomena and Nanophotonics XXV, 116841D (2021).
14. **R. Yanagimoto***, E. Ng*, M. Jankowski, T. Onodera, M. M. Fejer, H. Mabuchi, “Broadband Parametric Downconversion as a Discrete-Continuum Fano Interaction,” arXiv:2009.01457.
15. **R. Yanagimoto*,** T. Onodera*, E. Ng, L. G. Wright, P. L. McMahon, H. Mabuchi, “Engineering a Kerr-based Deterministic Cubic Phase Gate via Gaussian Operations," Physical Review Letters **124**, 240503 (2020).
16. **R. Yanagimoto,** E. Ng, T. Onodera, H. Mabuchi, “Adiabatic Fock-state-generation scheme using Kerr nonlinearity," Physical Review A **100,** 033822 (2019).
17. **R. Yanagimoto,** P. L. McMahon, E. Ng, T. Onodera, H. Mabuchi, “Embedding entanglement generation within a measurement-feedback coherent Ising machine," arXiv:1906.04902 (2019).
18. N. Nemitz, A. A. Jørgensen, **R Yanagimoto**, F. Bregolin, H. Katori, "Modeling light shifts in optical lattice clocks," Physical Review A **99**, 033424 (2019). (Editors’ suggestion)
19. D. B. S. Soh, **R. Yanagimoto**, E. Chatterjee, H. Mabuchi, “Nonlinear optical response of a local surface plasmon coupled to a 2D material”, arXiv:1902.06943 (2019).
20. **R. Yanagimoto**, N. Nemitz, F. Bregolin, H. Katori, "Decomposed description of Ramsey spectra under atomic interactions," Physical Review A **98**, 012704 (2018).

Honors and Awards

Stanford Q-FARM Ph.D. Fellowship *2020 – 2022*

- Annual financial support of 50,000 USD for 2 years

Fellowship from Masason Foundation *2017 – 2022*

- Masason foundation is a public interest incorporated association founded by Masayoshi Son supporting "youth who will create the future."
- Financial support (entire tuition) for pursuing degree and research at Stanford University

Distinguished thesis award *Mar. 2017*

- Awarded by the Department of Applied Physics, the University of Tokyo for the undergraduate thesis research
- The award is given to distinguished thesis research of the year

Dean Award (Faculty of Engineering, The University of Tokyo) *Mar. 2017*

- The award is given to one graduating student with the best academic and research records in each department