Ryotatsu Yanagimoto | Curriculum Vitae

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Education

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

- Expected dissertation title: "Quantum dynamics of broadband nonlinear optics"
- GPA: 3.873/4.000

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

- First two years (April 2013 – March 2015) at the Junior Division at College of Arts and Sciences. GPA: 3.34/4.00
- Last two years (April 2015 – March 2017) at the Department of Applied Physics, Faculty of Engineering. GPA: 3.95/4.00
- Dissertation title: "Characterization of collisional shifts in optical lattice clocks based on asymmetries in the Ramsey spectrum"

Research Activities

Stanford University **Stanford, CA, USA**
Graduate research (PI: Prof. Hideo Mabuchi) *Sep. 2017 – Dec. 2017, Apr. 2018 – present*

- Working on ultrafast quantum nonlinear optics and their applications for quantum engineering and information processing (refer to publications section for more details)
- Having been involved in experiments on ultra-fast pulsed optical parametric oscillators

Graduate research assistant (PI: Prof. Monika Schleier-Smith) *Jan. 2018 – Mar. 2018*

- Involved in cavity-assisted spin-exchange experiments with rubidium atoms

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

- Experimental work on the characterization of lattice light shifts in Yb^{171} optical lattice clocks
- Involved in the precision measurements of the frequency ratio between Yb^{171} and Sr^{87}

Undergraduate research assistant (PI: Prof. Hidetoshi Katori) *Apr. 2016 – Mar. 2017*

- Both theoretical and experimental work on the characterization of collisional frequency shifts in Yb^{171} optical lattice clocks (part of the research performed at the University of Tokyo)
- Awarded Distinguished Thesis Award and Dean Award (Faculty of Engineering)

Durham University **Durham, UK**

Research Intern (PI: Prof. Damian Hampshire) *Jan. 2016 – Mar. 2016*

- Characterizations of superconducting materials for International Thermonuclear Experimental Reactor (ITER)

Publications and Preprints

1. **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).
2. **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).
3. **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).
4. **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).
5. **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).
6. **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.
7. **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).
8. **R. Yanagimoto,** E. Ng, T. Onodera, H. Mabuchi, "Adiabatic Fock-state-generation scheme using Kerr nonlinearity," Physical Review A **100,** 033822 (2019).
9. **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).

10. 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)
11. 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).
12. **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

Iwai Hisao Memorial Tokyo Scholarship *2015 – 2017*

- Annual financial support of 1.2M JPY awarded for the outstanding academic records at the University of Tokyo

Professional Memberships

American Physical Society (APS)

Optica (formerly OSA)