

Yefeng Mei, Ph.D.

Research Fellow

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RESEARCH INTERESTS

My research interests include, but are not limited to, Rydberg Atoms, Many-Body Physics, Quantum Optics, Nonlinear Optics, Cavity Quantum Electrodynamics, Quantum Information Processing, Laser Cooling and Trapping, Quantum Measurement, Precision Measurement, Quantum Gas, Quantum Photonics, Solid-States Quantum Optics, etc.

EXPERIENCES

- Research Fellow** 06/2020 – Present
Supervisor: Prof. Alex Kuzmich, Department of Physics, University of Michigan, USA
- Teaching Assistant** 09/2015 – 12/2017
Department of Physics, HKUST, Hong Kong, China
- Research Assistant** 03/2015 – 08/2015
Supervisor: Prof. Shengwang Du, Department of Physics, HKUST, Hong Kong, China

EDUCATION

- Ph.D. in Physics** 09/2015 – 05/2020
Advisor: Prof. Shengwang Du, Department of Physics, HKUST, Hong Kong, China
Thesis: *Energy-Time Entanglement of Photons*
- B.S. in Physics** 09/2009 – 08/2013
Advisor: Prof. Chuangang Ning, Department of Physics, Tsinghua University, China
Thesis: *Experiments in Cosmic-Ray Muon Lifetime Measurement*

HONORS & AWARDS

- Postgraduate Research Excellence Award HKUST, 2019
UGC Research Travel Grant HKUST, 2019
Postgraduate Studentship Award HKUST, 2015-2019
CUPT Third Prize Nanjing, 2011

PROFESSIONAL SERVICES

Editorial Board Member:

Frontiers in Physics, review editor, May 2022 - Present

Journal Reviewer:

Scientific Reports, *Optics Express* (OE), *Journal of the Optical Society of America B* (JOSAB), *Physics Letters A*, *Applied Optics*, *AVS Quantum Science* (AQS).

JOURNAL PUBLICATIONS

- [1] Yefeng Mei, Yin Li, Huy Nguyen, Paul R. Berman, and Alex Kuzmich, “Trapped alkali-metal Rydberg qubit,” *Phys. Rev. Lett.* 128, 123601 (2022).
- [2] Yefeng Mei, Yin Li, Huy Nguyen, Paul R. Berman, and Alex Kuzmich, “Dynamics of interaction-induced dephasing for collective Rydberg excitations,” in preparation (2022).
- [3] Yefeng Mei, Yiru Zhou, Shanchao Zhang, Jianfeng Li, Kaiyu Liao, Hui Yan, Shi-Liang Zhu, and Shengwang Du, “Einstein-Podolsky-Rosen energy-time entanglement of narrowband biphotons,” *Phys. Rev. Lett.* 124, 010509 (2020).
- [4] Yue Jiang*, Yefeng Mei*, Ying Zuo, Yanhua Zhai, Jensen Li, Jianming Wen, and Shengwang Du, “Anti-parity-time symmetric optical four-wave mixing in cold atoms,” *Phys. Rev. Lett.* 123, 193604 (2019). (*** Equal contributions**)
- [5] Shanchao Zhang*, Yiru Zhou*, Yefeng Mei*, Kaiyu Liao, Yongli Wen, Jianfeng Li, Xin-Ding Zhang, Shengwang Du, Hui Yan, and Shi-Liang Zhu, “ δ -quench measurement of pure quantum-state wavefunction,” *Phys. Rev. Lett.* 123, 190402 (2019). (*** Equal contributions**)
- [6] Yue Jiang, Yefeng Mei, Yueyang Zou, Ying Zuo, and Shengwang Du, “Intracavity cold atomic ensemble with high optical depth,” *Rev. Sci. Instrum.* 90, 013105 (2019).
- [7] Xianxin Guo, Yefeng Mei, and Shengwang Du, “Single photon at a configurable quantum-memory-based beam splitter,” *Phys. Rev. A* 97, 063805 (2018).
- [8] Yefeng Mei, Xianxin Guo, Luwei Zhao, and Shengwang Du, “Mirrorless optical parametric oscillation with tunable threshold in cold atoms,” *Phys. Rev. Lett.* 119, 150406 (2017).
- [9] Yueyang Zou, Yue Jiang, Yefeng Mei, Xianxin Guo, and Shengwang Du, “Quantum heat engine using electromagnetically induced transparency,” *Phys. Rev. Lett.* 119, 050602 (2017).
- [10] Xianxin Guo, Yefeng Mei, and Shengwang Du, “Testing the Bell inequality on frequency-bin entangled photon pairs using time-resolved detection,” *Optica* 4, 388 (2017).
- [11] Yushi Hu, Tianye Wang, Yefeng Mei, Zhao Zhang, and Chuangang Ning, “A simple setup to measure muon lifetime and electron energy spectrum of muon decay and its Monte Carlo simulation,” *Physics and Engineering* 26, 27 (2016).

CONFERENCE PROCEEDINGS

- [1] Yefeng Mei, Yin Li, Huy Nguyen, Brian Yang, Paul R. Berman, Alex Kuzmich, “Towards quantum networking using collective Rydberg qubits,” SPIE Quantum Communications and Quantum Imaging XX Conference (OP431), San Diego, California, USA, August 21 – 25, 2022. (**Accepted**)
- [2] Yefeng Mei, Yin Li, Huy Nguyen, Paul R. Berman, Alex Kuzmich, “Dynamics of interaction-induced dephasing for collective atomic qubits,” Midwest Cold Atom Workshop (MCAW) 2021, Purdue University, Indiana, USA, November 13, 2021.
- [3] Yin Li, Yefeng Mei, Huy Nguyen, Paul R. Berman, Alex Kuzmich, “Collective Rydberg qubits for quantum networks,” Midwest Cold Atom Workshop (MCAW) 2021, Purdue University, Indiana, USA, November 13, 2021.
- [4] Yefeng Mei, Yin Li, Huy Nguyen, Paul R. Berman, Alex Kuzmich, “Interaction-induced dynamics of collective atomic excitations,” The 52nd Annual Meeting of the APS Division of

Atomic, Molecular and Optical Physics (DAMOP), Session K07: Transport Dynamics in Cold Atom Systems, paper K07.00002, Virtual, USA, May 31 – June 4, 2021.

- [5] Yin Li, Yefeng Mei, Huy Nguyen, Paul R. Berman, Alex Kuzmich, “Many-body Rabi oscillations for atoms confined in a state-insensitive optical lattice,” The 52nd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session U08: Quantum systems with long range interactions, paper U08.00005, Virtual, USA, May 31 – June 4, 2021.
- [6] Yefeng Mei, Yiru Zhou, Shanchao Zhang, Jianfeng Li, Kaiyu Liao, Hui Yan, Shi-Liang Zhu, and Shengwang Du, “Direct Characterization of Einstein-Podolsky-Rosen Energy-Time Entangled Narrowband Biphotons,” The 51st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session J02: Quantum Optics, paper J02.00009, Portland, Oregon, USA, June 1 - 5, 2020.
- [7] Yue Jiang, Yefeng Mei, Ying Zuo, Yanhua Zhai, Jensen Li, Jianming Wen, and Shengwang Du, “Non-Hermitian Optical Four-Wave Mixing in Cold Atoms,” The 51st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session M03: Nonlinear Optics, paper M03.00010, Portland, Oregon, USA, June 1 - 5, 2020.
- [8] Yefeng Mei, Xianxin Guo, and Shengwang Du, “Mirrorless optical parametric oscillation with four-wave mixing,” 2019 Joint Annual Conference of Physical Societies in Guangdong-Hong Kong-Macao Greater Bay Area, Guangzhou, China, July 26 - 29, 2019.
- [9] Yanhua Zhai, Yue Jiang, Yefeng Mei, Ying Zuo, Shengwang Du, and Jianming Wen, “Non-Hermitian Nonlinear Optics without Gain and Loss,” Nonlinear Optics (NLO), OSA Technical Digest (online) paper NM2B.5, Waikoloa Beach, Hawaii, USA, July 15 - 19, 2019.
- [10] Yefeng Mei, Xianxin Guo, and Shengwang Du, “Configurable Beam Splitting of Single Photon in Cold Atoms,” Conference on Lasers and Electro-Optics (CLEO), OSA Technical Digest (online) paper FM2A.2, San Jose, California, USA, May 5 - 10, 2019.
- [11] Yue Jiang, Yefeng Mei, Yueyang Zou, Ying Zuo, and Shengwang Du, “Efficiently Loading Cold Atomic Ensemble into an Optical Cavity with High Optical Depth,” Conference on Lasers and Electro-Optics (CLEO), OSA Technical Digest (online) paper JTU2A.122, San Jose, California, USA, May 5 - 10, 2019.
- [12] Xianxin Guo, Yefeng Mei, Luwei Zhao, and Shengwang Du, “Mirrorless Optical Parametric Oscillation in Cold Atoms,” The 49th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session U07: Quantum Optics II, paper U07.00010, Ft. Lauderdale, Florida, USA, May 28 - June 1, 2018.
- [13] Yue Jiang, Yueyang Zou, Yefeng Mei, Xianxin Guo, and Shengwang Du, “Nontraditional Quantum Heat Engine with Cold Atoms,” The 49th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session R04: Nonlinear and Many-body Physics, paper R04.00010, Ft. Lauderdale, Florida, USA, May 28 - June 1, 2018.
- [14] Xianxin Guo, Yefeng Mei, and Shengwang Du, “Testing the Bell inequality on frequency-bin entangled photon pairs using time-resolved detection,” Frontiers in Optics, OSA Technical Digest (online) paper JW4A.26, Washington D.C., USA, September 18 - 21, 2017.

PRESENTATIONS

- [1] “Towards quantum networking using collective Rydberg qubits,” SPIE Quantum Communications and Quantum Imaging XX Conference (OP431), San Diego, California, USA, August 21 – 25, 2022. **(Invited) (Accepted)**
- [2] “Trapped collective Rydberg qubit for quantum networking,” SIQSE Invited Talk No. 204, Shenzhen Institute for Quantum Science and Engineering and Department of Physics, Southern University of Science and Technology, March 17, 2022. **(Invited)**
- [3] “Interaction-induced dynamics of collective atomic excitations,” The 52nd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session K07: Transport Dynamics in Cold Atom Systems, paper K07.00002, Virtual, USA, May 31 – June 4, 2021.
- [4] “Energy-time entanglement of photons,” School of Physics, Huazhong University of Science and Technology, August 16, 2020. **(Invited)**
- [5] “Direct Characterization of Einstein-Podolsky-Rosen Energy-Time Entangled Narrowband Biphotons,” The 51st Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session J02: Quantum Optics, paper J02.00009, Portland, Oregon, USA, June 1 - 5, 2020.
- [6] “Mirrorless optical parametric oscillation with four-wave mixing,” 2019 Joint Annual Conference of Physical Societies in Guangdong-Hong Kong-Macao Greater Bay Area, Guangzhou, China, July 26 - 29, 2019. **(Invited)**
- [7] “Configurable Beam Splitting of Single Photon in Cold Atoms,” Conference on Lasers and Electro-Optics (CLEO), OSA Technical Digest (online) paper FM2A.2, San Jose, California, USA, May 5 - 10, 2019.
- [8] “Mirrorless Optical Parametric Oscillation in Cold Atoms,” The 49th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics (DAMOP), Session U07: Quantum Optics II, paper U07.00010, Ft. Lauderdale, Florida, USA, May 28 - June 1, 2018.