

Haonan Liu

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Professional Appointments

- **National University of Singapore** Singapore
Centre for Quantum Technologies *03/28/2022–Present*
 - Research fellow
 - Theory group leader
 - PI: Dr. Travis L. Nicholson
- **University of Colorado Boulder** Boulder, CO, United States
JILA *12/27/2021–02/28/2022*
 - Postdoctoral associate
 - PI: Professor Murray J. Holland

Education

- **University of Colorado Boulder** Boulder, CO, United States
JILA & Department of Physics *08/22/2016–12/15/2021*
 - **Ph.D.** in Physics & **M.S.** in Physics
 - Thesis title: Superradiant Atomic Beam Laser
 - Thesis supervisor: Professor Murray J. Holland
- **University of Richmond** Richmond, VA, United States
School of Arts & Science *08/19/2012–05/08/2016*
 - **B.S.** in Physics (Honors) & **B.A.** in Mathematics, *summa cum laude*
 - Honors thesis title: Fisher Matrix Optimization of Cosmic Microwave Background Interferometers
 - Thesis supervisor: Professor Emory F. Bunn
- **University of Oxford** Oxford, United Kingdom
Department of Physics *10/05/2014–06/22/2015*
 - Exchange student

Publications

- W.-H. Png, **H. Liu**, and T. L. Nicholson, *Collaborative Quantum Sensing with a Trapped Ion Application*, in preparation.
- **H. Liu**, S. B. Jäger, J. Cooper, T. L. Nicholson, and M. J. Holland, *Superradiant Emission of a Thermal Atomic Beam into an Optical Cavity*, Phys. Rev. A **104**, 033711 (2021).
- S. B. Jäger, **H. Liu**, J. Cooper, and M. J. Holland, *Collective Emission of an Atomic Beam into an Off-Resonant Cavity Mode*, Phys. Rev. A **104**, 053705 (2021).

- S. B. Jäger, **H. Liu**, A. Shankar, J. Cooper, and M. J. Holland, *Regular and Bistable Steady-State Superradiant Phases of an Atomic Beam Traversing an Optical Cavity*, Phys. Rev. A **103**, 013720 (2021).
- **H. Liu**, S. B. Jäger, X. Yu, S. Touzard, A. Shankar, M. J. Holland, and T. L. Nicholson, *Rugged mHz-Linewidth Superradiant Laser Driven by a Hot Atomic Beam*, Phys. Rev. Lett. **125**, 253602 (2020).
- **H. Liu** and E. F. Bunn, *Fisher Matrix Optimization of Cosmic Microwave Background Interferometers*, Phys. Rev. D **93**, 023512 (2016).
- **Google Scholar** page:
<https://scholar.google.com/citations?user=kqwH9FAAAAAAJ&hl=en&authuser=2>

Invited Talks

- Invited talk to “integrated quantum clock” (iqClock, a European consortium of six universities and six industry partners), *Steady-State Superradiant Laser with an Atomic Beam Source*, virtual, June 2020.

Peer-Reviewed Journals

- MDPI journals
 - Physics
 - Quantum Reports

International & National Presentations

- **Oral presentations**
 - 52nd Annual Meeting of the American Physical Society (APS) Division of Atomic, Molecular and Optical Physics (DAMOP), virtual, May 2021.
 - 51st Annual Meeting of the APS DAMOP, virtual, May 2020.
 - 50th Annual Meeting of the APS DAMOP, Milwaukee, WI, United States, May 2019.
 - 49th Annual Meeting of the APS DAMOP, Ft. Lauderdale, FL, United States, May 2018.
 - 227th National Meeting of American Astronomical Society, Kissimmee, FL, United States, Jan. 2016.
- **Poster presentations**
 - Quantum Technologies for Fundamental Physics School 2023, University of Cambridge, Cambridge, United Kingdom, Jan. 2023.
 - National Science Foundation (NSF) Physics Frontier Center virtual site visit, virtual, Dec. 2020.
 - JILA PosterFest, Boulder, CO, United States, Oct. 2019.

Honors and Awards

- *David C. Evans Awards for Outstanding Achievement in Scholarship*, University of Richmond, Apr. 2016.
- *Rhodes Scholar Finalist*, Nov. 2015.
- *Dean's List*, University of Richmond, Aug. 2012–May 2016.
- *Robins Science Scholarship*, full tuition with room and board, University of Richmond, Aug. 2012–May 2016.

Press Coverage

- <https://www.quantumlah.org/about/highlight/2020-12-superradiant-laser>
- <https://jila.colorado.edu/news-events/articles/laser-cavities-and-quest-holy-grail>
- https://www.chinadaily.com.cn/china/2016-01/25/content_23229249.htm
- <https://news.richmond.edu/features/article/-/13415/2016-david-c.-evans-awards-school-of-arts-and-sciences-recognizes-outstanding-achievement.html>
- <https://blog.richmond.edu/physicsnews/2016/04/15/ur-physics-senior-is-finalist-for-rhodes-scholarship/>