Reuben R. W. Wang, PhD Student

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Education

2019 – current — **Ph.D., JILA, University of Colorado Boulder** Physics.
Research: *Theoretical atomic and molecular physics.*

2019 – 2022 — **M.S., University of Colorado Boulder** Physics.
GPA: 4.0/4.0

2017 – 2018 — **U.G., Massachusetts Institute of Technology** Physics.
GPA: 4.9/5.0

2015 – 2019 — **B.Eng., Singapore University of Technology and Design** EPD.
Grade: *Summa Cum Laude.*

Research Experience

2019 – current — **Graduate Research Assistant,** JILA.
Perform theoretical research in atomic and molecular physics, focusing on collective dynamics in non-degenerate ultracold dipolar gases, and data-driven learning algorithms for molecular models.

2017 – 2018 — **Undergraduate Research Assistant,** MIT.
Computational research in X-Ray Scattering under the supervision of professor Riccardo Comin to perform numerical simulations for spectroscopy of quantum materials.

2016 — **Undergraduate Research Assistant,** SUTD-MIT IDC.
Performed theoretical research in quantum many-body open systems supervised by professor Dario Poletti. Wrote propriety numerical solvers in C++ to simulate an dissipative, periodically driven Bose-Hubbard dimer system which showcased clear signatures of period doubling. The results culminated in a publication in Physical Review E (rapid communication), 97, 020202(R), 2018.

2015 — **Undergraduate Research Assistant,** SUTD.
Experimental research under professor Cheah Chin Wei to synthesize ferroelectric $KNbO_3$ and CNT/graphene nanofibers using electrospinning for photocatalytic dye degradation.

Teaching Experience

2018 — **Instructor, *The Quantum World (IAP course)*,** SUTD.
Devised and conducted a workshop to teach introductory concepts on quantum mechanics and quantum computation, targeted at engineering students with no prior knowledge of quantum theory.

2017 — **Teaching Assistant, *Engineering in the Physical World (10.008)*,** SUTD.
Undergraduate teaching assistant, facilitating in-class learning and engagement amongst students during weekly recitation sessions. Held office hours for students.

2016/2018 — **Teaching Assistant, *Advanced Mathematics 2 (10.004)*,** SUTD.
Undergraduate teaching assistant, facilitating in-class learning and engagement amongst students during weekly recitation sessions. Held office hours for students.

Technical Experience

2019 **Robotics Engineer (Optimization Algorithms),** Bifrost (Singapore).
Wrote and designed optimization algorithms for path finding and optimal pose determination in an automated robotic pick-and-place system for pallet sorting. The project was a proof of principle system for proprietary synthetic data based AI technologies.

2017 **Electrical Engineer (Lights & Hardware),** Praxis+.
Designed, rigged-up and wired in access of 6000 LED lights to programmable circuit boards with high voltage power supplies for ***Phosphene****, an arts and technology installation displayed at the* ***Singapore Night Festival****.*

2016 **Mechanical Engineer (Drivetrain Design & Fabrication),** MIT.
Designed a drivetrain system for manned electric powered boats using the 3D modelling software SOLIDWORKS*. Fabricated the drivetrain which was used to propel a boat of propriety design on the Charles river (Massachusetts).*

Talks

2022 **DAMOP (Orlando, FL),** APS.
Conference talk titled "Anisotropic Thermal Conduction in Ultracold Dipolar Gases", on the thermal conduction in non-degenerate ultracold dipolar gases. Authors: Reuben R. W. Wang and John L. Bohn.

March Meeting (Chicago, IL), APS.
Conference talk titled "Anisotropic Thermal Transport in Dilute Dipolar Gases", on the thermal conduction in non-degenerate ultracold dipolar gases. Authors: Reuben R. W. Wang and John L. Bohn.

2019 **Current Issues in Game Theory & Social Dynamics,** SUTD.
Invited speaker to give a talk entitled "quantum information processing for decision modelling and games" to researchers in the field of game theory and social dynamics. Organized by professor Zsombor Méder.

Research Publications

Journal Articles

1. Wang, R. R. W., & Bohn, J. L. (2022a). Thermal conductivity of an ultracold paramagnetic bose gas. *Phys. Rev. A, 106*, 023319. doi:10.1103/PhysRevA.106.023319
2. Patscheider, A., Chomaz, L., Natale, G., Petter, D., Mark, M. J., Baier, S., … Ferlaino, F. (2022). Determination of the scattering length of erbium atoms. *Phys. Rev. A, 105*, 063307. doi:10.1103/PhysRevA.105.063307
3. Li, J.-R., Tobias, W. G., Matsuda, K., Miller, C., Valtolina, G., De Marco, L., … Bohn, J. L. et al. (2021). Tuning of dipolar interactions and evaporative cooling in a three-dimensional molecular quantum gas. *Nature Physics, 17*(10), 1144–1148. Retrieved from https://doi.org/10.1038/s41567-021-01329-6
4. Wang, R. R. W., & Bohn, J. L. (2021). Anisotropic thermalization of dilute dipolar gases. *Phys. Rev. A, 103*, 063320. doi:10.1103/PhysRevA.103.063320
5. Wang, R. R. W., Sykes, A. G., & Bohn, J. L. (2020). Linear response of a periodically driven thermal dipolar gas. *Phys. Rev. A, 102*, 033336. doi:10.1103/PhysRevA.102.033336
6. Wang, R. R. W., Xing, B., Carlo, G. G., & Poletti, D. (2018). Period doubling in period-one steady states. *Phys. Rev. E, 97*, 020202. doi:10.1103/PhysRevE.97.020202

Preprints

1. Wang, R. R. W., & Bohn, J. L. (2022b). Thermoviscous hydrodynamics in non-degenerate dipolar bose gases. doi:10.48550/ARXIV.2208.08353

Skills

Languages	Reading, writing and speaking competencies for English, Mandarin Chinese.
Software	Python, MATLAB, Mathematica, C++, LaTeX, SOLIDWORKS.
Experience	Academic research, LaTeX typesetting and publishing, mechanical design and fabrication.

Awards and Achievements

Scholarships

2019 **Graduate Student Fellowship**, UCB.

2016 **Global Leadership Scholarship**, SUTD-MIT.

2015 **Undergraduate Merit Scholarship**, SUTD.

Awards

2019 **Honors List (Senior Year)**, SUTD.

2018 **Laurel (Technology and Design) Award**, SUTD.

2017 **Honors List (Sophomore & Junior Years)**, SUTD.

2016 **Honors List (Freshman Year)**, SUTD.

References

Available on Request