

MIKE A.D. TAYLOR

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EDUCATION

University of Rochester

Doctor of Philosophy in Optics

GPA: 3.93 out of 4.00

Awards: NSF Graduate Research Fellow, Munnerlyn Fellowship Award, PhD Academic Excellence Award

Rochester, NY

Anticipated May 2025

University of Rochester

Bachelor of Science in Optics

Minor: Chemistry

GPA: 3.86 out of 4.00—Cum Laude with Highest Distinction in Optics

Awards: Optics Faculty Choice Award, Meliora Alumni Scholarship Award

Rochester, NY

May 2020

PUBLICATIONS

M. A. D. Taylor, A. Mandal, W. Zhou, and P. Huo, "Resolution of Gauge Ambiguities in Molecular Cavity Quantum Electrodynamics," *Phys. Rev. Lett.*, vol. 125, p. 123602, Sep 2020.

M. A. D. Taylor, A. Mandal, and P. Huo, "Resolving Ambiguities of the Mode Truncation in Cavity Quantum Electrodynamics," *Optics Lett.*, vol. 47, p. 1446-1449, Mar 2022.

A. Mandal*, **M. A. D. Taylor***, B.M. Weight*, E. R. Koessler*, X. Li, and P. Huo, "Theoretical Advances in Polariton Chemistry," *Chem. Rev.* (Submitted and on ChemArxiv).

A. Mandal*, **M. A. D. Taylor***, and P. Huo, "A Theory for Cavity Modified Ground-State Chemical Reactivities via Electron-Photon Interactions," *J. Phys. Chem. A.* (Submitted and on ChemArxiv).

M. A. D. Taylor, B. Weight, and P. Huo, "Light-Matter Interaction Hamiltonians in Cavity Quantum Electrodynamics," (In preparation).

M. A. D. Taylor, A. Mandal, and P. Huo, "Reciprocal Asymptotically Decoupled Hamiltonian for Cavity Quantum Electrodynamics," (In preparation).

* Equal Contribution

INDUSTRY EXPERIENCE

Apple Inc.

Depth Hardware Simulation Intern

Cupertino, CA

Jun. 2022 – Sept. 2022

- Characterized Smudge BSDF for stray light analyses in LightTools to improve simulation speed and accuracy.
- Evaluated efficacy and efficiency of FRED to model smudge for optical systems.
- Investigated feasibility of Metropolis Ray Transport algorithms for ray-tracing functionalities using Mitsuba 3.

Synopsys Inc.

Software Development Intern in the Optical Solutions Group

Pasadena, CA

May 2020 – Aug. 2020

- Developed entirely new utilities from scratch (including the Cost Estimator tool) in CODE V using various languages including C#, C++, C, and Macro-Plus that improved customer usability and increased functionality.
- Revamped raytracing utilities in LightTools using VBA to directly address customer needs.
- Performed live product demonstrations to both internal and customer audiences.

John's Hopkins University Applied Physics Laboratory

Technical Aide in the Space Research Group

Laurel, MD

May 2019 – Nov. 2019

- Assembled, aligned, and tested a Thermal IR Hyper-Spectral Imaging Telescope.
- Derived and experimentally validated microbolometer spectral response with image processing in MATLAB.
- Analyzed stray light with Zemax and designed a new baffle system with CREO for a mid-wave IR camera system for future cube-sat missions.
- Renovated a cryogenically cooled high vacuum chamber that could hold a 4' x 4' platen.

Zygo Corp.

Optical Engineering Intern

Middlefield, CT

Jun. 2018 – Aug. 2018

- Assembled and validated large aperture laser interferometers.
- Gained experience in laser alignment and high precision assembly.

PRESENTATIONS

- Mar. 30, 2023 **M. A. D. Taylor** and P. Huo, “Engineering Hamiltonians for Cavity Quantum Electrodynamics for the Deep Strong Coupling Regime”
Spring 2023 Bi-Annual Industrial Associates (IA) Symposium, **Oral Presentation**, Rochester, NY
- Mar. 6, 2023 **M. A. D. Taylor**, B. Weight, and P. Huo, “Reciprocal Asymptotically Decoupled Hamiltonian for use in Arbitrary Cavity Quantum Electrodynamics Potentials”
APS March Meeting, **Oral Presentation**, Las Vegas, NV
- Oct. 2, 2022 **M. A. D. Taylor**, A. Mandal, and P. Huo, “Resolution of Gauge Ambiguities in Molecular Cavity Quantum Electrodynamics”
ACS North Eastern Regional Meeting, **Oral Presentation**, Rochester, NY
- Jun. 4, 2022 **M. A. D. Taylor**, A. Mandal, and P. Huo, “Resolution of Gauge Ambiguities in Molecular Cavity Quantum Electrodynamics”
ACS Middle Atlantic Regional Meeting, **Oral Presentation**, Trenton, NJ
- May 18, 2022 **M. A. D. Taylor**, A. Mandal, and P. Huo, “Resolution of Gauge Ambiguities in Molecular Cavity Quantum Electrodynamics”
Optica Conference on Lasers and Electro-Optics (CLEO), Poster Presentation, San Jose, CA
- Oct. 21, 2021 **M. A. D. Taylor**, A. Mandal, and P. Huo, “Resolution of Gauge Ambiguities in Molecular Cavity Quantum Electrodynamics”
Fall 2021 Bi-Annual Industrial Associates (IA) Symposium, Poster Presentation, Rochester, NY
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TEACHING EXPERIENCE

Chemistry Department, University of Rochester

Rochester, NY

Quantum Chemistry I (PhD level)

Aug. 2021 – Dec. 2021

- Lectured and helped design interactive recitation sessions to supplement and expand beyond the material covered in lectures.
- Graded homework assignments and hosted office hours.

Quantum Chemistry/Molecular Thermodynamics

Workshop Leader/TA

Aug. 2019 – May 2020

- Mentored a small group of students with weekly workshops to solidify their understanding of lecture material.

Institute of Optics, University of Rochester

Rochester, NY

Electromagnetic Waves (PhD level)

Jan. 2022 – May. 2022

- Graded homework assignments and hosted office hours.

Geometrical Optics and Physical Optics Lab TA

Aug. 2018 – May 2019

- Advised and graded lab groups in their first year of Optics labs
 - Taught error analysis and proper lab techniques
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SKILLS

- Proficient in the Scrum Agile Development Process.
- Proficient using: Python, Rust, CODE V, LightTools, MATLAB, CREO, SOLIDWORKS.
- Familiar with C#, C++, C, VBA, Fortran, Unix, Zemax, FRED, Mx, and version control with Git.
- Proficient in the installation and use of Ubuntu Linux distributions.
- Experience with friction saw, miter saw, drill press, and other heavy machinery.