CASEY CLARK

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EDUCATION

Doctor of Philosophy in Materials Science and Engineering anticipated 05/28
University of Utah
GPA: 4.0

Master of Science in Physical Chemistry 08/23-12/24
University of Oregon
GPA: 3.46

Bachelor of Science in Biochemistry 08/21-12/22
University of Utah
GPA: 3.58

RESEARCH INTERESTS

My research focuses on topological quantum materials, specifically amorphous topological insulators, as platforms for next-generation electronics and quantum technologies. I apply ab initio methods alongside AI-driven tools to connect fundamental theory with data-centric materials exploration. My goal is to uncover structure–property relationships for topological materials. I study how composition, strain, and disorder influence quantum and electronic properties in aperiodic systems. These results inform the design and validation of robust, device-relevant materials for demanding environments.

RESEARCH EXPERIENCE

Graduate Research Assistant 08/25-Present
Liu & Sparks Groups, Materials Science and Engineering, University of Utah

- Helped improve the memory utilization & pipeline of KnowMat, an LLM-based tool that takes materials science PDFs & extracts structured data
- Assessed the precision, recall, & F1 score of the LLM-based agentic data extraction tool KnowMat on thermoelectric properties across multiple academic journals
- Currently using VASP, Wannier90, WannierTools, & MLIPs to study bulk amorphous topological insulators

Graduate Research Assistant 06/24-12/24
Hendon Group, Chemistry Department, University of Oregon

- Obtained the density of states for metal nanoparticles in metal-organic frameworks to assess the tunability of photocatalysis using FHI-aims

- Performed FHI-aims chain calculations to get the activation barrier for the conductivity of protonic defects in 2D metal-organic frameworks
- Computed density functional calculations in VASP to obtain the band structure & density of states for various materials
- Obtained the spin density of diamond NV center spin qubits using VASP

Undergraduate Research Assistant 10/21-3/23

Cheatham Group, College of Pharmacy, University of Utah

- Prepared initial molecular structures & systems using the Chimera software & AMBER software suite
- Ran minimization/equilibration processes for each system using the AMBER software suite
- Ran molecular dynamics simulations for each system using the AMBER software suite & confirmed their progress utilizing the VMD software
- Completed R.M.S.D. and fractional helicity analysis for each system using the AMBER software suite

PUBLICATIONS

Sayeed HM, **Clark C**, Mohanty T, Sparks T. KnowMat: An Agentic Approach to Transforming Unstructured Material Science Literature into Structured Data. (2025)
https://doi.org/10.1007/s40192-026-00455-4

Diamond, B., **Clark, C.**, Hendon, C. MOF-encapsulation of metal nanoparticles alter the d-band center (2025)
In review

Love, O.D., Lima, M.C.P., **Clark, C.H.**, Cornillie, S., Roalstad, S.M., Cheatham III, T.E. Evaluating the accuracy of the AMBER protein force fields in modeling dihydrofolate reductase structures: Misbalance in the conformational arrangements of the flexible loop domains. Journal of Biomolecular Structure and Dynamics. (2022)
https://doi.org/10.1080/07391102.2022.2098823