

William S. Parker

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EDUCATION

University of Oregon, Eugene, OR Fall 2024
Doctor of Philosophy, Physics
PhD Advisor: Benjamin J. McMorran
GPA: 3.880

Chapman University, Orange, California Spring 2018
Bachelor of Science, Physics; Bachelor of Science, Mathematics; Minor, General Music
GPA: 3.729 (*Magna Cum Laude*)

EXPERTISE

Interpersonal skills: Fostering and managing multi-institutional collaborations. Effectively communicating scientific results through written reports, journal articles, conference talks, and team meetings. Mentoring and training colleagues.

Experimental expertise: Cryogenic STEM and Lorentz TEM, SEM/FIB, SEM with polarization analysis, AFM, ultra-high vacuum systems, electron holography, electron-optical beam shaping

Quantitative skills: numerical physics simulation, signal/image analysis, Fourier electron optics, linear regression, machine vision, statistical analysis

Computational skills: Python, LaTeX, high-performance computing, SSH, *nix command line, JS/HTML/CSS, Mathematica, Blender 3D graphics, OpenCV, FIJI

Scientific package & web development (with Git VC): [ltempy](#), [ovf2io](#), [frctl](#) | ([GitHub](#))

RELEVANT RESEARCH EXPERIENCE

PhD Candidate, University of Oregon, Eugene, OR Mar. 2020 – Dec. 2024
Determined and modeled the 3D structure of hybrid skyrmions in magnetic multilayer thin films.

- Combined complementary electron microscopy techniques to isolate surface and bulk behavior.
- Conceived of and formalized a novel 3D topological object, the half-integer hopfion, to link stability to underlying topology.
- Derived quantitative measurables from this formalism to validate against experimental results.
- Designed and performed micromagnetic simulations to bridge experiment and theory.
- Developed novel holographic magnetic imaging techniques at the National Center for Electron Microscopy with the potential for atomic-resolution, depth-resolved magnetic microscopy.
- Presented work to the scientific community by giving talks at a number of international microscopy and magnetics conferences.
- Wrote and published first-author works in Physical Review B and Microscopy & Microanalysis.

Graduate Research Assistant, University of Oregon, Eugene, OR June 2018 – Mar. 2020
Investigated practical considerations of an orbital angular momentum sorter in a commercial TEM.

- Modeled electrostatic electron-optical elements with finite element methods and Fourier optics.
- Fabricated prototype elements using atom probe tomography sample preparation techniques in a dual-beam FIB/SEM system.
- Presented feasibility considerations to a wide audience at the international Microscopy and Microanalysis conference, earning the MSA Student Scholar award.

Undergraduate Researcher, Chapman University, Orange, CA Spring 2017 – Spring 2018
Created vortex optical states for Raman spectroscopy applications using a digital micromirror device.

- Wrote custom software to generate custom optical modes with binary diffractive holograms.
- Designed and built a Mach-Zehnder interferometer to characterize the generated optical states.

A complete list of publications, conference talks, honors, awards, teaching experience, and outreach efforts can be found in my CV at [wsparker.com](#).