



Position Summary

The Molecular Foundry Division (MFD) at Lawrence Berkeley National Laboratory (LBNL) invites applicants for a postdoctoral position to pursue robot-assisted chemical solution synthesis and characterization of organic-inorganic 2D halide perovskite thin films incorporating chiral organic molecules. The scope of the postdoc position will be the development of a closed loop workflow integrating robotics with the use of machine learning (ML)-driven data interpretation to accelerate the discovery of new chiral 2D metal halide perovskites and optimize their thin film synthesis for high chiroptical response. Collaboration with LBNL's Center for Advanced Mathematics for Energy Research Applications (CAMERA) is envisioned to integrate ML. Experimental work includes thin film synthesis using an automated robotic platform, batch characterization starting from the early nucleation stages to final films, and analysis of large data sets. An extension of the [existing workflow](#) is part of this project and involves development and integration of optics into the robotic platform to enable *in situ* characterization, on-the-fly characterization, and guidance of the experiment. The nature of the work is experimental and will be performed in a fast-paced, interdisciplinary, and collaborative environment. The ability to work both independently and as part of a multidisciplinary team is essential.

Key Responsibilities

- Thin film synthesis of chiral 2D halide perovskites via chemical solution processing involving a liquid handling robotic platform
- Material characterization and analysis including diffraction, spectroscopy, and polarization-dependent techniques
- Drive the development of workflows implementing ML through collaborations to enable closed-loop experimentation
- Handle and analyze large data sets, preferably via Python
- Single crystal synthesis of chiral metal halide perovskites
- Integrate *in situ* characterization during robotic synthesis
- Close interaction with LBNL researchers to leverage high throughput synthesis and characterization platforms for materials discovery
- Compose manuscripts for submission to peer reviewed journals and give presentations of scientific findings at conferences

Essential Qualifications

- PhD in Physics, Materials Science, Chemistry, Mechanical Engineering or related field
- Strong background in halide perovskite thin film synthesis and characterization
- Programming experience to handle and analyze large data sets
- Creativity in applying concepts to different research problems
- Self-motivated individual that is able to work independently, yet also willing to contribute as part of a team
- Demonstrated teamwork skills by working with students from different levels and backgrounds and/or collaborating with others
- Strong publication record
- Excellent written and oral communication skills
- Commitment to working safely at all times, including radiation and laser hazards

Desired Qualifications

- Experience with high throughput synthesis and characterization
- Experience with batch processing, automated data analysis, workflow development
- Experience with *in situ* experimentation

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