



## Postdoc (experimental) Data-Driven Synthesis of Oxide Materials for Energy Applications

The Materials Sciences Division (MSD) at Lawrence Berkeley National Laboratory (LBNL) invites applicants for a postdoctoral position to pursue chemical solution synthesis and characterization of complex oxide materials (e.g. Li-Mn-Ti-O,  $\text{Fe}_2\text{CoO}_4$ ,  $\text{VBiO}_4$ ,  $\text{NiCo}_2\text{O}_4$ ). The scope of the postdoc position will be the investigation of synthesis mechanisms where synthesis of crystalline compounds should be thought of as complex reaction paths rather than direct formation of the target phase. This research is part of a team science program - D2S2 Data-Driven Synthesis Science - that combines robotic synthesis, text-mining, high-throughput *ab initio* computation of thermochemical reaction energetics, and *in situ* (synchrotron) observation of reaction pathways. Experimental work in the lab as well as at the synchrotron includes chemical solution synthesis of thin films and powder samples involving manual experiments and an automated robotic platform, batch characterization starting from the early nucleation stages to final samples, and analysis of large data sets. The work 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 and powder synthesis of oxide materials via chemical solution processing through manual experiments or assisted by a liquid handling robotic platform
- Structural and compositional batch characterization of powder/thin film materials
- Analysis of large data sets, development of automated data analysis pipelines
- *In situ* characterization to investigate crystallization pathway
- Analyze data, compose manuscripts for submission to peer reviewed journals, and give presentations of scientific findings at conferences
- Work innovatively in a multidisciplinary team

### Essential Qualifications

- PhD in Physics, Materials Science, Chemistry, Mechanical Engineering or related field
- Background in material synthesis via chemical solution processing/sol-gel
- Material characterization and analysis including diffraction, composition analysis, and electrochemical techniques
- Experience to handle and analyze large data sets, preferable via Python
- 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 powder/thin film synthesis
- Experience with batch processing, automated data analysis, coding
- Background working on battery materials
- Experience with *in situ* experimentation
- Previous experience performing measurements at synchrotrons

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