

Opportunity Title: ORNL Energy Storage Modeling Analysis Post-Master's Research

Opportunity Reference Code: ORNL20-02-CSED

Organization Oak Ridge National Laboratory (ORNL)

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Description Oak Ridge National Laboratory (ORNL) is the largest U.S. Department of Energy science and energy laboratory, conducting basic and applied research to deliver transformative solutions to compelling problems in energy, environment, and security.

The position requires collaboration within a multi-disciplinary research environment consisting of computational scientists, experimentalists, and engineers. The successful candidate will be expected to effectively work and communicate with technical peers and program managers. He or she will be expected to consistently deliver high-quality research results on time and within budget.

The Virtual Integrated Battery Environment (VIBE) is developed and deployed as cloud-based application for battery simulations that integrates data and software from various research communities. The project work includes developing integrated workflows using data analytics and machine learning tools to build surrogate models that can be coupled with physics-based simulations to predict the safety and degradation mechanisms of various battery chemistries.

This opportunity is available through the ORNL Post-Master's Research Associate Program, an employee-based workforce development program designed to create a pipeline of STEM talent for DOE and the U.S. workforce by engaging recent graduates in work-based research and training experiences at ORNL. The selected candidate will receive a mentored experience with expected learning outcomes, while engaged in meeting work objectives that support ORNL's mission.

Major Duties and Responsibilities:

- Gather requirements from the technical leads and define the scope of the workflow.
- Maintain electrochemical/safety experiments raw data stacks collected from the facility and curate the data for analysis.
- Process the data for model development based on ML tool sets.
- Develop jupyter(/python) notebooks to be released through VIBE to compare physics-based simulations with data models.
- Maintain code repositories and follows software quality standards.
- Document and report the results at meetings and present at various forums.

Qualifications Candidates should have a master's degree in engineering with a background in physics-based modeling and simulation of batteries/energy storage systems.

Preferred Skills:

- Hands-on experience with data collection and curation for ML analysis.
- Experience with generic programming, object-oriented analysis, and



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python scripting languages.

- Understanding of verification and validation and the relationship between theory, experiments, and simulation.

Living in East Tennessee: While the opportunity to work at ORNL is an amazing experience in itself, it's easy to overlook everything else East Tennessee has to offer if you haven't had the opportunity to spend time here. From spending your weekends downtown at Knoxville's farmers market, the Rhythm n' Blooms Music Festival, or the Dogwood Arts Festival, to some of the best hiking, kayaking, and camping in the U.S., East Tennessee has something to offer everyone.

The ORNL Post-Master's Research Associate Program is administered by Oak Ridge Associated Universities through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education (ORISE).

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| Eligibility Requirements | <ul style="list-style-type: none">• Degree: Master's Degree received within the last 60 month(s).• Discipline(s):<ul style="list-style-type: none">◦ Computer, Information, and Data Sciences (1 )◦ Engineering (4 )◦ Mathematics and Statistics (1 )• Age: Must be 18 years of age |
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