

Postdoctoral Fellow in AI4Energy

Development of Self-Driving Laboratories for Emergent Materials Discovery Applications

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SALARY	START DATE	APPOINTMENT	APPLY BY
\$63,480 USD/year	October 1, 2026	12 months (renewable)	September 1, 2026

Ted Sargent and group at Northwestern University invite applications for a resourceful, hands-on Postdoctoral Fellow to join AI4Energy, our program building agentic-AI-guided workflows for energy and materials research, in a role centered on the physical and software engine that makes autonomous discovery possible. We are seeking a builder who is energized by, and shows broad interest in, self-driving and autonomous labs.

Self-driving laboratories couple robotic experimentation, instrument automation, and orchestration software with AI decision-making so that hypotheses, experiments, measurements, and analysis close into a single continuous loop. We are assembling the hardware and software backbone for this capability and deploying it against problems where the search space is vast and the payoff is high, such as catalysts for clean energy conversion and chemical manufacturing, materials for extreme environments, and critical minerals and materials. The Fellow will architect the platforms that generate high-quality, richly labeled, AI-ready data at a throughput and reliability that manual experimentation cannot reach.

We welcome chemists, materials scientists, and chemical engineers who are effective automation architects, scientific programmers, and applied agentic AI experts, as well as applicants trained in mechanical engineering, robotics, electrical engineering, or computer science who bring a distinct and valuable perspective on how to make a laboratory run itself.

RESPONSIBILITIES

- Design, build, integrate, and operate robotic and automated experimental platforms — spanning synthesis, sample handling, and electrochemical or materials characterization — that execute autonomous, closed-loop discovery campaigns.
- Develop the orchestration software that connects instruments, robots, schedulers, databases, and AI decision agents into reliable, observable, end-to-end workflows, with robust error handling, provenance capture, and reproducibility.
- Interface hardware and software directly with motion control, sensors and actuators, custom fixtures, and instrument APIs, turning heterogeneous equipment into a programmable, self-driving system.
- Deploy and adapt these platforms across problem domains, such as catalysis, materials for extreme environments, and critical-mineral separation and extraction, partnering with domain scientists to translate scientific goals into automated protocols.
- Work hand-in-hand with AI/ML colleagues so that agentic models can propose the most informative next experiment and the platform can execute it without a human in the loop; benchmark autonomous campaigns against expert-guided workflows.

- Lead projects from concept through publication and/or deployed capability; contribute to milestone reporting, internal research reviews, mentoring of graduate students, and the pursuit of external funding.

QUALIFICATIONS

- Ph.D. in chemistry, chemical engineering, materials science, or a related field with domain knowledge in the aforementioned areas, or in mechanical engineering, robotics, electrical engineering, or computer science with a demonstrated interest in scientific automation, optimization, and AI integration, completed or expected before the start date.
- Demonstrated ability to build things that work: robotic or automated platforms, laboratory instrumentation, control systems, or the software that ties them together, with a portfolio (publications, deployed systems, open-source projects, or hardware) that reflects technical depth, creativity, and resourcefulness.
- Strong scientific programming and sound software-engineering practice (version control, APIs, testing, modular design); comfort integrating instruments and robots through their control interfaces.
- Hands-on experience with laboratory automation, robotics, or mechatronics, for example liquid handling, motion platforms, sensing and actuation, or high-throughput experimental systems.
- Interest in, and ideally experience with, autonomous experimentation and AI/ML-guided discovery (e.g., Bayesian optimization, active learning, agentic AI), Scientific LLMs, and database design and engineering.
- Familiarity with at least one of the target application areas — catalysis and electrochemistry, materials for extreme environments, or critical mineral and materials separation and extraction — with a willingness to learn the others; expertise with in situ or operando characterization is a plus.
- Excellent written and verbal communication skills and the ability to thrive in a large, multi-institutional, interdisciplinary team spanning Northwestern and partner laboratories.

HOW TO APPLY

Please include the following in your application package:

- A one-page research proposal responsive to the directions and criteria outlined in this job ad
- Your academic CV, including a section dedicated to your first-authored papers. This should include a list of three referees who are prepared to be consulted

Please use the [application link here](#).