

Postdoctoral Fellow in Materials for Extreme Environments

Materials Discovery for Enhanced Geothermal Systems, Nuclear Fission/Fusion, and Lithium Extraction

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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 an accomplished, energetic Postdoctoral Fellow to develop functional materials for extreme environments.

The project is motivated by energy and resource systems in which materials must operate in coupled high-temperature, high-pressure, high-salinity, and strongly corrosive environments, including enhanced geothermal systems, nuclear fission and fusion, and lithium extraction from aggressive brines. We seek to identify materials that can tolerate geothermal brines, radiolytic or molten-salt environments, liquid-metal or hydrogen-rich fusion-relevant media, and chemically complex Li-extraction streams. These settings place simultaneous demands on corrosion resistance, mechanical robustness, interfacial stability, ion transport, fouling resistance, and lifetime under realistic operating stress. Candidate material families may include high-entropy alloys, refractory and corrosion-resistant alloys, high-entropy oxides, sulfides, borides, mixed-metal oxides, protective coatings, temperature-responsive polymers, polymer composites, and polymeric or inorganic membranes for lithium extraction. We are especially interested in candidates who can combine synthesis, composition control, mechanistic testing, and high-throughput or semi-automated workflows to rapidly query robustness across broad composition spaces.

RESPONSIBILITIES

- Design, synthesize, and characterize functional materials for enhanced geothermal systems, fission, fusion, and lithium extraction.
- Develop accelerated workflows to test corrosion resistance, passivation, dissolution, ion transport, fouling, hydrogen uptake, or electrochemical stability.
- Build high-throughput or semi-automated approaches for preparing, characterizing, and testing materials libraries, including HEAs, HEOs, sulfides, borides, polymers, and inorganic membranes.
- Collaborate with the Argonne team on complementary characterization and performance measurements, contributing to a shared, cross-institutional understanding of structure-performance relationships.
- Lead research projects from hypothesis development through publication, and contribute to reports, proposals, and internal research planning.
- Mentor graduate students and research assistants and help establish experimental best practices for new extreme-environment testing platforms.

QUALIFICATIONS

- Ph.D. in materials science, mechanical engineering, chemistry, chemical engineering, nuclear engineering, physics, or a related field, completed or expected before the start date.
- Strong background in at least one of the following: corrosion science, metals/alloys, ceramics, polymers, ion separation and nanofiltration membranes, high-temperature materials, nuclear materials, or geothermal materials.
- Hands-on experience with materials synthesis and characterization. Experience with alloys, oxides/sulfides/borides, polymers, membranes, coatings, corrosion, microscopy, spectroscopy, diffraction, or surface analysis is especially welcome.
- Interest in high-throughput experimentation, accelerated durability testing, data-rich materials screening, or automated synthesis and characterization workflows.
- Ability to work independently while contributing to a collaborative and interdisciplinary research environment.
- Strong written and verbal communication skills, with a record of rigorous research and first-author publications.

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](#).