

2024 - 2025 Energy Research Grants – Cycle 18 NCESR

The Nebraska Center for Energy Sciences Research (NCESR), a collaboration between the Nebraska Public Power District (NPPD) and the University of Nebraska-Lincoln (UNL), was established in April 2006 to conduct research on renewable energy sources, energy efficiency and energy conservation; and to expand economic opportunities and improve quality of life for Nebraska and the nation.

Goal. The overall goal of the NCESR is to foster research and education in energy sciences by providing funding to support innovative research and collaboration among University of Nebraska-Lincoln faculty and other public- and private-sector organizations and businesses working in energy sciences.

Request for Proposals. The NCESR released the Request for Proposals (RFP) for its eighteenth competitive round of Energy Research Grants on March 20, 2023. The External Advisory Committee (EAC) met on December 8, 2023 and selected the following nine energy research projects:

- *Low Cost and Clean Energy Storage Based on Molecular Ferroelectrics and Antiferroelectrics* – **Dr. Xiaoshan Xu**, Associate Professor of Physics and Astronomy, College of Art and Science.
- *Cure-in-Place Phase Change Thermal Interface Material for Superior Thermal Management in High-Power Energy Systems* – **Dr. Eric Markvicka**, Assistant Professor of Mechanical & Materials Engineering, College of Engineering.
- *Discovery of Multiple Element Alloys for Preventing Hydrogen Embrittlement* – **Dr. Jian Wang**, Professor of Mechanical and Materials Engineering, College of Engineering.
- *Electrocatalysts for Green Hydrogen: Tailored 2D Materials based on Metal Carbide* – **Dr. Siamak Nejati**, Associate Professor of Department of Chemical and Biomolecular Engineering, College of Engineering.
- *Next Generation Embedded Wireless Sensors for Structural Health Monitoring of Wind Turbines* – **Dr. Joseph Turner**, Robert W. Brightfelt Professor of Mechanical and Materials Engineering, College of Engineering.
- *An Intelligent Adaptive Modular Battery Energy Storage System for the Built Environment* – **Dr. Moe Alahmad**, Associate Professor of Durham School of Architectural Engineering and Construction, College of Engineering.
- *Microgrid Mastermind: The Quest for Reliable Electricity* – **Francis John Hay**, Extension Educator (Energy) of Biological Systems Engineering, Institute of Agriculture and Natural Resources and College of Engineering.

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- *Subsurface Hydrogen Migration and Reactions for Geological Hydrogen Production and Engineered Storage* – **Dr. Seunghee Kim**, Associate Professor of Civil and Environmental Engineering, College of Engineering.
- *Systems Metabolic Engineering of Pseudomonas Putida for the Bioproduction of C6 Chemicals from Lignin-derived Aromatics* – **Dr. Wei Niu**, Associate Professor of Chemical and Biomolecular Engineering, College of Engineering.