

NSF DigiCARES Seed Grant/Scholarship – Funding Opportunity Announcement

1. Overview

The NSF DigiCARES (Accelerating Community-Centric Energy Transformation through AI-driven Digital Twinning for Climate-Aware Resilience) initiative addresses climate adaptation challenges with aging energy infrastructure, with a special emphasis on local communities. By fostering cross-institutional collaboration, DigiCARES aims to leverage AI-driven digital twin technology, renewable energy integration, and deep community engagement to optimize energy utilization, reduce energy burden, and enhance climate resilience.

The DigiCARES Seed Grant offers short-term, targeted funding to encourage early-career researchers and students to undertake innovative, interdisciplinary research projects aligned with the broader goals of the NSF DigiCARES initiative. Proposals must demonstrate clear relevance to climate resilience, AI and digital twin applications, energy equity, and the transformation of community-based energy infrastructures.

2. Purpose

Stimulate Innovative, Interdisciplinary Research: Enable novel approaches that combine data science, AI, climate science, and social sciences to tackle climate and energy challenges in local communities.

Foster Cross-Institutional Collaboration: Encourage investigators from the DigiCARES partner institutions (including those across New Mexico, Montana, Oklahoma, and Alabama) to share expertise, leverage high-performance computing resources, and build synergy with broader DigiCARES objectives.

Advance Energy Affordability: Align research with communities' needs by integrating community engagement, socioeconomic factors, and energy justice principles into proposed solutions.

3. Funding Amount and Number of Awards

Award Range: \$2,000– \$5,000 per project.

Anticipated Awards: 10 – 15 per year, awarded through a competitive selection process.

Project Expenses: May cover research costs, work-related travel, and other needs directly relevant to the proposed research.

Application deadline: April 1st 2025

4. Eligibility

Undergraduate and Graduate Students: Must have a faculty advisor or mentor from a DigiCARES partner institution.

Postdoctoral Researchers: Within five years of doctoral degree completion, affiliated with a partner institution.

Other Early-Career Researchers: Including new or transitioning faculty, research associates, or extension professionals whose work aligns with DigiCARES research topics.

5. Priority Research Topics/Areas

Multi-Scale Climate Dynamics: Methods or tools to analyze climate extremes (heatwaves, droughts, wildfires) at local/regional scales; innovative approaches to predicting renewable energy potential under changing climate conditions.

Sociodemographic Energy Mapping: Integrating community engagement and socioeconomic variables to inform equitable, data-driven energy solutions in communities.

Community-Centric Planning and Operation: Novel frameworks that blend resilience in energy infrastructure planning, disaster response, and post-outage restoration.

AI-Driven Digital Twins: Development or extension of AI-based digital twin platforms that simulate climate-energy-community interactions, including load forecasting, renewable integration, and scenario testing for extreme events.

Energy Policy Analysis: Forward-looking policy recommendations for renewable integration, resilience, and climate mitigation in the context of local communities (e.g., Kit Carson, Mora-San Miguel, Navajo Nation).

Interactive Visual Narratives and Outreach: Approaches for transforming complex data and modeling outputs into user-friendly visual tools, especially for community stakeholders and policymaking.

6. Proposal Guidelines

Required Components: Applications must be submitted as a single PDF to DigiCaresNSF@gmail.com. Ensure all components (cover page, project description, budget, CV, etc.) are included.

Cover Page (up to 1 page): Project title, principal investigator(s), and key collaborators.

Project Description (up to 3 pages):

- **Alignment with DigiCARES Goals:** Which of the priority areas your project addresses and how.
- **Research Objectives & Methods:** Description of the approach, particularly how AI/digital twins, community engagement, or climate data will be integrated.

- Anticipated Outcomes: Scientific contributions, potential for energy affordability, and community impact.
- Timeline & Milestones: Clearly delineate phases or steps of the project.

Budget & Justification (1 page):

- Allocation for research materials, travel for data collection or collaboration, and any other justifiable expenses.

Curriculum Vitae (2-page max per investigator).

7. Reporting Requirements

Quarterly Status Updates: Brief progress reports to the Award Selection Committee, highlighting accomplishments, challenges, and next steps.

Final Report: Summarizing key findings, lessons learned, and outcomes (e.g., datasets, publications, or best-practice recommendations).

Dissemination: Awardees are encouraged to publish or present their findings through DigiCARES-led workshops, conferences, or community outreach events. All outputs should acknowledge NSF DigiCARES Seed Grant support.

8. Selection Process

Peer Review: An Award Selection Committee will review proposals based on:

Relevance to DigiCARES objectives (e.g., climate resilience, digital twin innovation, community impact).

Scientific/Technical Merit: Clarity of objectives, soundness of methodology, feasibility, and potential impact.

Broader Impacts: Potential for community empowerment, workforce development.

Cross-Institutional Collaboration: Inclusion of diverse expertise and multi-institution synergy.

Decision: Award announcements will be made within 30 days after the application deadline. Each applicant will receive feedback on strengths and areas for improvement.

9. Contact Information

For questions about the program, application process, or alignment with the NSF DigiCARES broader goals, contact: DigiCaresNSF@gmail.com