

**Workshop for AI-Powered Materials Discovery
at Great Plains sponsored by**



Closing Summary

Acknowledgement: NSF 2427805

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June 22–25, 2025

Workshop Summary

- **Workshop on AI-Powered Materials at the Great Plains**
Dates: June 22–25, 2025 | **Location:** University of South Dakota
- **~200 participants** from **50+ institutions** across the U.S.
- **52 high-quality talks** delivered over two and a half days
- Engaged scientists, engineers, data scientists, and educators
- Covered both foundational AI topics and cutting-edge applications in materials science

Scientific Highlights

- **Topics addressed in the talks:**
- **AI Infrastructure** for materials discovery and integration
- Development and curation of **materials databases**
- Advances in **high-throughput** and **high-volume calculations**
- Application of **high-dimensional modeling** to complex materials systems
- Use of AI in experimental design, characterization, and prediction

Key Applications

- **Key application areas included:**
- Quantum materials
- Energy storage and conversion
- Biomedical materials
- Functional and structural materials

Education & Workforce Development

- **Education and Training Highlights:**
- **Dedicated talks** on AI-driven education in materials science
 - Emphasis on interdisciplinary curriculum blending physics, biology, chemistry, CS, and materials engineering
 - Integration of real-world datasets and open-source tools into coursework
- **Mini-schools and tutorials** held during the workshop
 - Hands-on sessions on:
 - Machine learning for materials informatics
 - High-throughput screening techniques
 - Data curation and model validation workflows
- **Student participation** across all levels (undergraduate, graduate, and postdoctoral)
 - Opportunities for networking and mentorship
 - Strong engagement in Q&A sessions and poster discussions
- **Looking Ahead:**
- Sharing **AI Summer Schools across the national**
- Interest in establishing a **regional training network** across Great Plains institutions

Panel Reflections

- **Panel Discussion: Future Directions & Needs**
- Identified **critical bottlenecks** in data sharing, reproducibility, and model validation
- Emphasized the importance of **interdisciplinary collaboration**
- Called for development of **shared experimental database and platforms** and **standardized benchmarks**
- Highlighted the need for **AI-native materials workflows** from data generation to discovery
- Advocated for **community-wide efforts** to align goals and share best practices

Closing Remarks & Looking Ahead

- This workshop has built **momentum and community** for AI-driven materials research in the Great Plains and beyond
- It has laid the groundwork for **new collaborations**, especially across Great Plains jurisdictions
- Participants are encouraged to:
 - Continue interdisciplinary conversations
 - Share tools and datasets
 - Engage in joint proposals and consortium-building
- We look forward to **continued progress** in developing two white papers with expanded participation and outcomes

Photos



6/25/2025

USD, Vermillion, South Dakota