

SOS27: Abstract for session “Trustworthy and Energy Efficient Foundation Models for Science”

The training of large AI foundation models for scientific applications presents several critical challenges that demand innovative solutions. These range from handling complex multimodal scientific data to ensuring model reliability and addressing environmental impacts. We will bring together leading experts in artificial intelligence, high-performance computing, and computational science to explore these challenges and identify needed methodological advancements.

Key areas for presentation and discussion will include:

- The complexities of integrating and learning from diverse scientific data types, including complex graphs and time series data. These multimodal challenges require new approaches that go beyond current language model capabilities.
- The critical need for trustworthy and validated models that can reliably support scientific discovery and decision-making. This includes developing rigorous verification processes and innovative methods to address biases and ensure accuracy.
- The substantial energy and computational resource requirements of these models, which raise important questions about environmental impact and sustainability.

With the help of experts in these domains, we seek to enable discussions that will help chart a path forward in developing more capable, reliable, and efficient foundation models for scientific applications.