

Artificial Intelligence and Neutron Scattering Spectroscopy

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Abstract: Neutron scattering is a versatile technique for studying the structure and dynamics of materials. Unfortunately, there are a limited number of neutron sources available in the world to perform scientific experiments. In this talk, I will discuss how artificial intelligence can be used to operate these instruments more efficiently. I will also discuss how AI can accelerate the analysis of data that we take and aid our understanding. For the analysis, I will focus on our recent work with Vision Transformers and powder diffraction data. I will also touch on our recent use of LLMs for instrument control.

Biography: Dr. Ratcliff earned his Ph.D. from Rutgers University and has extensive experience in condensed matter physics, including frustrated magnets, multiferroics, and topological materials. He has coauthored over 80 publications, received the NIST Bronze Medal twice, and is a Fellow of the American Physical Society. His current work focuses on advanced materials and the application of AI to neutron scattering.