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Wang Landau Sampling: Only a "Random" Walk in the Park? DEREK OSTROM, SPENCER HART, Brigham Young University, LANCE NELSON, Brigham Young University - Idaho, GUS HART, Brigham Young University — For years the Metropolis algorithm has been the king of random sampling (Monte Carlo) in computational methods. However, one method, Wang Landau sampling, promises to be a powerful replacement to the famous Metropolis algorithm. I explore the usefulness of the Metropolis algorithm with both the magnetic and alloy Ising models and show the validity of the Wang Landau sampling with the magnetic Ising as well as show the results of the previously untested alloy Ising. The usefulness of the Wang Landau sampling is evident in its ability to map the density of states of these models. From the density of states the free energy and entropy can be computed directly. In materials science, finding the entropy is arguably the most important and most difficult piece of information one can gain about a system. This method hopes to make material simulations more effective, hopefully giving a boost to the materials simulation community producing results faster for the world to use.

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