

Abstract Submitted  
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**Beyond Phase Transitions: an Algorithmic Approach to Flocking Behavior** GARETT BROWN, MANUEL BERRONDO, None — The emergent behavior of certain collective systems such as starling murmurations reveals coherent behavior arising from the simple, individual interactions of its entities. Using a two-dimensional algorithmic model, we can show that self-driven particles (boids) group together and display emergent flocking characteristics. The model is based on the ideas of consensus and frustration as well as the dynamic interplay between global and local phase transitions. The frustration is a perturbation that drives the boids beyond the simple phase transitions and towards chaotic behavior while the consensus is a topological averaging, that balances the frustration. The results are interpreted in terms of global and local order parameters, and correlation functions. They are presented along with animations created using Wolfram Mathematica.

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None

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